NSTA AREA CONFERENCE ON SCIENCE EDUCATION

CELEBRATE SCIENCE:

10,000 CONNECTIONS

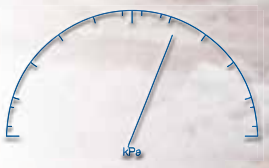
MINNEAPOLIS

OCTOBER 27–29, 2016

#NSTA16

National Science Teachers Association

What happens to tires when it's cold?



When temperatures fall, they succumb to the *pressure* of winter.

$69

Wireless Pressure
PS-3203

Come see us in booth #501

FREE Inquiry-based workshops

Friday 10/28 Room 101C

Modeling Climate Change: Dissolving Carbon Dioxide.
8:00 - 9:00 am
Rising temperatures are not the only impact of increased CO_2 emissions. The Earth's oceans act as a buffer by dissolving excess CO_2 into solution. In this quick hands-on activity, create a model to investigate the effects of dissolved CO_2 using the wireless pH sensor and experience how easy inquiry can be.

Exploring Misconceptions: Speed & Velocity.
9:30 - 10:30 am
Speed and velocity are two ways to describe the motion of an object that students often confuse. In this workshop, you will use the wireless Smart Cart to collect real-time motion data and compare the graphs of the Smart Cart's speed and velocity.

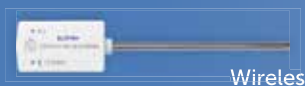
Exploring Misconceptions: Is there a Difference Between Heat and Temperature?
11:00 am - 12:00 pm
Are heat and temperature the same thing or are they different? This hands-on workshop using SPARKvue and wireless temperature sensors will provide you effective new ways to teach the concepts of heat and temperature, central to physical science.

PASCO scientific

www.pasco.com/wireless
A-0392_NSTA_MN_10/16

PASCO Wireless Solutions

Save time and money in your science lab with



Wireless Temperature: PS-3201 $39

Wireless pH: PS-3204 $59

Wireless Conductivity: PS-3210 $69

Wireless Force Acceleration: PS-3202 $99

Wireless Light: PS-3213 $55

Wireless Current: PS-3212 $49

Wireless Voltage: PS-3211 $49

Collect and graph data in seconds. No additional hardware or interface is required!

We believe teachers are the real miracles of modern science.

Teachers get up every morning knowing they have the potential to change the world – just by showing up in the classroom and inspiring a love of science. Yes, they may feel overworked and even underappreciated. But by some miraculous feat, they remain true to their mission, touching the lives of students by imparting the gifts of knowledge and curiosity. We know. Because Carolina equips them for the task.

Learn more about our commitment at **www.carolina.com/withyou**

Carolina.
Right there with you.

CAROLINA®
www.carolina.com

#onlyatNSTA

Discover the Power of NSTA Membership

Only at NSTA can you attend a conference alongside thousands of like-minded educators dedicated to science education and gain a years' worth of content and strategies for your classroom.

Join us for our remaining fall area conferences:

Portland, OR, Nov. 10-12
and Columbus, OH, Dec. 1-3

Join the conversation on Twitter and share your #onlyatNSTA moments with us. @nsta

www.nsta.org/membership

NSTA National Science Teachers Association

NSTA 2016 Area Conference on Science Education

Celebrate Science: 10,000 Connections

Minneapolis, Minnesota • October 27–29, 2016

National Science Teachers Association

1840 Wilson Blvd.
Arlington, VA 22201-3000
703-243-7100
conferences@nsta.org
www.nsta.org

NSTA Affiliates

Association for Multicultural Science Education (AMSE)
Association for Science Teacher Education (ASTE)
Association of Science-Technology Centers (ASTC)
Council for Elementary Science International (CESI)
Council of State Science Supervisors (CSSS)
National Association for Research in Science Teaching (NARST)
National Middle Level Science Teachers Association (NMLSTA)
National Science Education Leadership Association (NSELA)
Society for College Science Teachers (SCST)

Welcome to Minneapolis: Celebrate Science: 10,000 Connections

Left to right, John C. Olson, Jean Tushie, and Lee Schmitt

Welcome to the Twin Cities and the Minneapolis Area Conference on Science Education. Minnesota is known as the "Land of 10,000 Lakes," and our conference theme is *Celebrate Science: 10,000 Connections.* We hope you make 10,000 connections with other educators, scientists, and exhibitors to support your science instruction.

Our conference strands provide this opportunity.

- *Teaching Science in a Connected World* focuses on connecting people from around the world via many forms of technology.
- *STEMify Instruction Through Collaboration* explores how to effectively engage students through STEM and STEM strategies
- *Celebrating Elementary Science and Literacy* highlights the importance of elementary science, helps teachers learn new knowledge and strategies for literacy and science integration, and celebrates elementary science.

To quote Garrision Keilor, "Nothing you do for children is ever wasted." Celebrate Science. We hope you find 10,000 connections to enhance your science instruction and excite the students you teach.

2016 Minneapolis Area Conference Committee Leaders
Jean Tushie, Lee Schmitt, and John C. Olson

Minneapolis Conference Committee

We at NSTA wish to express our heartfelt thanks to the members of the Minnesota Science Teachers Association for the many hours of time they volunteered in planning this conference.

Conference Chairperson

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Stacey Buchwald
Valley Middle School of STEM
Apple Valley, MN

Program Committee

Strand Leader: Teaching Science in a Connected World
Steven Walvig
The Bakken Museum
Minneapolis, MN

Strand Leader: Celebrating Elementary Science and Literacy Connections
Polly Saatzer
Garlough Environmental Magnet School
West Saint Paul, MN

Strand Leader: STEMify Instruction Through Collaboration Across the Curriculum
Claire Hypolite
Edison High School
Minneapolis, MN

Program Representative
Mary Colson
NSTA Director, District IX
Horizon Middle School
Moorhead, MN

Conference Advisory Board Liaison
Monica Ellis
Retired Elementary Classroom Teacher
Indianapolis, IN

President's Welcome

Connect, Collaborate, Celebrate—Teachers Are the Key

Welcome to NSTA's 2016 Minneapolis Area Conference on Science Education. The state with 10,000 lakes offers 10,000 opportunities for science professional development aligned to the most current science curricula and enhanced with the most current technology. This conference will provide an outstanding professional development opportunity focused on three strands that explore topics of current significance. These strands are based on my theme for the year *Connect, Collaborate, Celebrate—Teachers are the Key.*

In the strand *Teaching Science in a Connected World,* the emphasis will be to develop strategies that use effective technologies and tools to access information, deliver instruction, communicate ideas, and CONNECT with other teachers and students to build professional learning networks. From Maker Labs to the latest social media sharing, teachers will have access to technology for their classrooms.

If teachers are interested in the latest knowledge on STEM, then the strand *STEMify Instruction Through COLLABORATION Across the Curriculum* will explore STEM strategies to effectively engage students. STEM strategies can help bring together postsecondary, informal education, and community partners toward common goals. Project Based Learning, Robotics, and cyber missions are just some of the exciting discussions.

The third strand, *CELEBRATING Elementary Science Literacy Connections,* will emphasize that children are born investigators. They are curious about what is happening in their world and are anxious to find the reason why. Science is a way to develop student skills in thinking creatively and investigating their world. This strand will share strategies to integrate science and literacy to help develop the importance of building the foundation of the science process skills using literacy as the basic tool.

I encourage you to take advantage of this dynamic opportunity to attend as many sessions that meet your needs. NSTA has provided the CONNECT, now you must provide the COLLABORATE and CELEBRATE. Enjoy—Learn—Share—Network with others. Teachers are the Key!

Mary Gromko
2016–2017 NSTA President

Sponsors and Contributors to the Minneapolis Conference

NSTA, MnSTA, and the Minneapolis Planning Committee are extremely grateful to the following companies and associations for their generous contributions to the NSTA Minneapolis Area Conference on Science Education.

Sponsors

Minnesota Science Teachers Association
Southwest Airlines
Texas Instruments
Vernier Software & Technology

Contributors

American Association of Physics Teachers (AAPT)
American Chemical Society Education Division
American Society for Engineering Education
Science Museum of Minnesota
The Bakken Museum
The Works Museum

The environment is important to science educators. These programs are recyclable and were printed on recycled paper.

NSTA Conferences Go Green!

The National Science Teachers Association is committed to meeting today's environmental challenges by adopting eco-friendly practices both in our own day-to-day operations and at our conferences, workshops, and other events. In addition, we strongly encourage our contracted conference facilities to follow green practices as well. Here are some of the ways NSTA's conference department has worked to minimize our impact on the environment:

Conference Previews

Gone are the days of bulky, newspaper-style advance programs. Our conference preview is a smaller size and includes highlights for our three area conferences. As an added bonus, this new preview is more environmentally friendly, as it dramatically reduces both our print and mailing requirements.

Online Conference Information and Personal Scheduler

Most of your conference arrangements can now be accomplished online *(www.nsta.org/conferences)*. Register and make your housing reservations on the web. Program details are available to you on our website using the Session Browser/Personal Scheduler. Scheduling information on our website is up to date and more complete than that available through a printed piece.

Final Conference Programs by E-Mail/Conference App

All conference pre-registrants are sent an electronic version (PDF) of the final conference program by e-mail approximately one week prior to the conference, further reducing print and shipping requirements. Also, attendees are encouraged to use the NSTA Conference app, which provides all the tools necessary for a successful conference experience.

Recycled Paper and Sustainable Print Services

Conference previews and final conference programs are printed on recycled paper whenever possible. In addition, Walsworth Inc., the printer for our conference materials, is in strict compliance with all environmental laws and exceeds these standards in many areas. Wherever possible, Walsworth works to reduce and recycle waste, use reduced- or low-VOC chemicals, increase the recycled content of raw materials, and use soy- or vegetable-based inks. Walsworth has also obtained certifications with the Sustainable Forest Initiative (SFI) and the Forest Stewardship Council® (FSC) to ensure paper products are being harvested from environmentally responsible sources.

Environmentally Friendly Exhibition Practices

Our conference partner, Hargrove, Inc., offers many green product options and services in the production of our conference exhibitions, including 100% recyclable carpet and padding, recycled exhibit structures, a "reclaimer" that recycles 92% of all solvents the company uses in production of graphics, use of LP natural gas in 75–90% of show-site vehicles, and many biodegradable and recycled products such as trash bags and wastebaskets. Their green efforts are extended operationally with reductions in electricity, heating fuel, and water usage, as well as a move to 100% recyclable and biodegradable products.

Minneapolis Convention Center's Green Practices

The Minneapolis Convention Center (MCC) is committed to sustainability and assisting its customers in achieving their sustainability goals for meetings and conferences. Recently, MCC achieved level one certification to the ASTM standard.

Part of MCC's mission includes integrating a no-waste mentality. Its three sustainability goals are related to waste, energy, and water. Below are the highlights of the goals and their initiatives:

- In 2013, MCC increased its annual recycling rate to 49%, which added up to a total of 467 tons recycled. Recycling bins in public areas educate visitors about recycling and the addition of organics collection. In the back-of-house, waste centers have been renovated to recover all resources in the most efficient manner.
- MCC reduced its annual energy usage through retro-commissioning, improved staff scheduling, energy systems, as well as a series of LED lighting upgrades. The installation of high-speed roll-up doors in our exhibition halls has reduced heating and cooling costs.
- Its restroom renovations include fixtures that use at least 50% less water than the original fixtures, new dishwasher and spray nozzles use 80% less water, and new irrigation heads and adjusting operating hours to better fit the seasons and rain events have saved more than 3 million gallons of water per year.
- The solar array on the rooftop is connected directly to MCC's internal electrical system, producing 750,000 kWh of renewable electricity per year—the equivalent of powering 85 homes. It offsets 539 metric tons of carbon dioxide emissions annually.

"Go Green" at the Minneapolis Conference!

- Recycle your conference programs in the clearly marked recycle bins located throughout the Convention Center.
- Recycle or reuse your plastic badge holders—you can either turn them in at the NSTA Registration Counter or use them at future conferences.
- In advance of the conference, presenters are encouraged to post their presentations and handouts on the Session Browser/Personal Scheduler.
- If you prefer to bring handouts to your session, use double-sided printing and/or recycled paper.
- Walk or use public transportation when possible at the conference.
- Bring your own refillable water bottle to the conference.
- Evaluate sessions attended online.

Meeting Location and Times

The conference hotels are Hilton Minneapolis–Convention Center (*headquarters*), Hyat Regency Minneapolis, and Holiday Inn Express Hotel & Suites. Conference registration, exhibits, the Membership Booth, the NSTA Science Store, exhibitor workshops, and many sessions will be located at the Minneapolis Convention Center. Other sessions and events will be held at the Hilton Minneapolis. The conference will begin on Thursday, October 27, at 8:00 AM, and end on Saturday, October 29, at 12 Noon.

Registration

Registration is required for participation in all conference activities and the exhibits. The lapel badge e-mailed to you with your confirmation, or issued to you at registration on-site, is your "ticket of admission" to the Exhibit Hall and all conference activities except those for which a separate fee is stated.

The Registration Area, located in Hall C of the Convention Center, will be open during the following hours:

Wed., Oct. 26	5:00–7:00 PM
Thu., Oct. 27	7:00 AM–5:00 PM
Fri., Oct. 28	7:00 AM–5:00 PM
Sat., Oct. 29	7:30 AM–12 Noon

If you misplace your badge or tickets, present your personal ID at the Badge Pick-Up/Replacement Counter in the Registration Area and you will be issued replacements. Only one replacement badge will be issued.

Ground Transportation to/from Airport

Minneapolis–St. Paul International Airport (MSP) is approximately 16 miles from downtown Minneapolis. You'll find two terminals at the airport: Lindbergh and Humphrey. Ground transportation at the Lindbergh Terminal is accessible via the Tram Level. Ground transportation at the Humphrey Terminal is available at the Humphrey Ground Transport Center, located on the ground level of the Purple parking ramp directly across from the terminal building. For information on ground transportation options, visit the Minneapolis–St. Paul International Airport at *bit.ly/2dybVlz*. Taxi service is available at both terminals, and fares average $39–$49 to downtown Minneapolis.

—Photo courtesy of © Meet Minneapolis

Getting Around Town

Minneapolis is compact and easy to get around, no matter what mode of transportation you choose. Experience the history, culture, and energy of Minneapolis by traveling by foot. Minneapolis is home to a unique system of glass "tunnels" located one story above ground. These skyways will get you almost anywhere in climate-controlled bliss.

Metro Transit operates one of the largest public transportation systems in the country. Or you can take the Hiawatha Light Rail, which connects downtown Minneapolis with the airport and Mall of America and 17 other stations. Metro Transit now offers the new Green Line to the University of Minnesota and St. Paul. For a wealth of information on navigating the Minneapolis area, visit the Metro Transit website at *bit.ly/2dtptQJ*.

Conference Hotels

See page 8 for a list of hotels and a map of the downtown area. If you have questions or concerns regarding your housing, please contact Orchid Event Solutions (during business hours), Monday through Friday, 8:00 AM–7:00 PM CT at 877-352-6710 (toll-free) or 801-505-4611, or e-mail *help@orchideventsolutions.com*. Available Monday-Friday, 8 AM-7 PM CT. After hours and on Saturday, call 801-505-4104.

Parking

Parking is easy to find at the Convention Center. Right across the street is an underground parking ramp that is connected by a climate-controlled skyway system to the Convention Center and several downtown accommodations and attractions. There are a dozen parking ramps within easy walking distance, most connected to the Convention Center by skyway. Visit *bit.ly/2dLClnB* for directions to the Convention Center as well as parking rates and maps.

Airlines

NSTA has made arrangements with several major airlines and Amtrak to offer discounted fares to Minneapolis conference attendees. Visit *www.nsta.org/minneapolistravel* for details.

Discounted Rental Cars

The toll-free number to contact an NSTA-designated car rental company is:

Enterprise 800-593-0505 16AH230

* *go to* www.enterprise.com *and use "16AH230" in the "Optional: Coupon, Customer or Corporate Number" box, click on "search" and enter PIN "NST."*

Registration, Travel, and Hotels

1. **Hilton Minneapolis–Conv. Center**
   (Headquarters Hotel)
   1001 Marquette Ave. S.

2. **Hyatt Regency Minneapolis**
   1300 Nicollet Mall

3. **Holiday Inn Express Hotel & Suites Minneapolis Downtown Conv. Center**
   225 S. 11th St.

Shuttle service will not be provided as all hotels are within walking distance to the Convention Center.

—Photo courtesy of Jacob Slaton

NSTA Exhibits

The NSTA Exhibit Hall is a must-see! NSTA brings you the leading science education companies and organizations to showcase products, services, curricula, and much more. You'll discover something new and exciting in the world of science teaching.

The lapel badge e-mailed to you before the conference, or issued to you at registration on-site, is your "ticket of admission" to the Exhibit Hall and all conference activities. Maps of the Exhibit Hall and others meetings rooms will be accessible via our Conference app (see page 10). See page 105 for a complete list of exhibitors and contact information.

Exhibit Hall Hours. Located in Hall C, exhibits will be open for viewing during the following hours:

Thu., Oct. 27	11:00 AM–5:00 PM
Fri., Oct. 28	9:00 AM–3:00 PM
Sat., Oct. 29	9:00 AM–12 Noon

Did you know that NSTA offers Exclusive Exhibits Hall hours? During the hours listed below, there are no teacher sessions scheduled and it's a perfect time to visit the exhibits and discover all the products and services companies and organizations have to offer.

Thu., Oct. 27	11:00 AM–12:30 PM
Fri., Oct. 28	1:30–3:00 PM

Lead Retrieval. NSTA exhibitors use lead retrieval, a paperless tracking system that allows them to receive fast, accurate information about conference attendees who have visited their booths. With the lead retrieval system, an exhibitor scans your badge as you visit the booth. This allows exhibitors to send information to you while the conference is still fresh in your mind.

Exhibitor Workshops. Exhibitor-sponsored workshops for science teachers are offered throughout the conference. These workshops give you an opportunity to use a variety of commercial instructional materials. Attendance is on a first-come, first-served basis. See page 117 for a complete listing of exhibitor workshops.

NSTA Science Store

Visit us at the NSTA Science Store to explore a wide selection of resources and gear you'll love! You'll find hundreds of books that uniquely blend accurate science content with sound teaching strategies for science educators of all grade ranges and disciplines. Not only do we have books covering a wide range of topics to help you sharpen your content knowledge and hone your teaching methods, but we also carry a complete line of NSTA gear you can't find anywhere else—such as T-shirts, mugs, and pencils. We offer convenient free shipping when you place your order on-site at the conference. We've lined up a number of unique opportunities for conference-goers:

- Exclusive author signings and meet-and-greet opportunities
- Our latest books—A*rgument-Driven Inquiry in Physical Science; Inquiring Scientists, Inquiring Readers in Middle School; Disciplinary Core Ideas: Reshaping Teaching and Learning;* and *Uncovering Student Ideas in Earth and Environmental Science*—and our new children's books from NSTA Kids, including *Next Time You See a Cloud; From Flower to Fruit;* and Notable *Notebooks: Scientists and Their Writings*
- "I Love Science" and NSTA gear product lines to show your love of science and pride in teaching
- Member discounts of 20% on NSTA Press® items and 10% on books from other publishers for all attendees
- Daily book and gear specials, product giveaways, and more.

Meet the Presidents and Board/Council

Be sure to stop by Friday from 1:15 to 2:00 PM at the entrance to Hall C for a special session. Come "meet and greet" with your elected NSTA officers on your way to the exhibits. The President, President-Elect, and Retiring President along with your Board and Council members are looking forward to talking with you at the conference!

Conference Resources

Wi-Fi in Convention Center

Complimentary Wi-Fi internet access is available throughout the first floor lobbies of the Convention Center. It''s called "Free Internet" and can be used for checking e-mail and casual internet access.

MnSTA and WSST Booth

The Minnesota Science Teachers Association (MnSTA) and the Wisconsin Society of Science Teachers (WSST) booth is located in Hall C near the NSTA Registration Area. The booth will have membership forms and information about science activities in Minnesota, as well as our neighboring state, Wisconsin. Stop by to say hello and learn how we can keep you up to date on the latest happenings in our area.

Presenters and Presiders Check-In

If you are presenting or presiding at a session, please check in at the Presenters/Presiders booth in the Registration Area.

The NSTA Conference App

Navigate the conference from the palm of your hand! The NSTA Conference app provides all the tools necessary for a successful conference experience.

Features include the ability to view session and workshop listings by time and presenter; maps of the Convention Center, Hilton, and Exhibit Hall; social media plugins; and a note-taking tool. Scan the QR code or visit *www.nsta.org/conferenceapp* to download the app. Please make sure to create a CrowdCompass account when logging in to be able to export any notes taken within the app. *Note:* The NSTA Conference app does not sync to our online Personal Scheduler.

Graduate Credit Opportunity

Minneapolis conference attendees can earn one graduate-level credit hour in professional development through Framingham State University at NSTA's Minneapolis Area Conference. Participants must attend a minimum of 12 hours of conference sessions, submit a written report, and pay a fee of $179. To learn more about the assignment requirements and registration, visit *www.framingham.edu/nsta*. *Note:* Credit is by pass/fail only.

Deadline is November 30, 2016.

The Bakken Museum special offer • *www.thebakken.org*

The Bakken Museum is offering free admission to the NSTA Minneapolis Area Conference attendees (must show badge at visitor services desk). This offer is available **Thursday–Sunday, October 27–30.**

The Bakken is a one-of-a-kind museum inspiring a passion for innovation by exploring the potential for science, technology, and the humanities to make the world a better place.

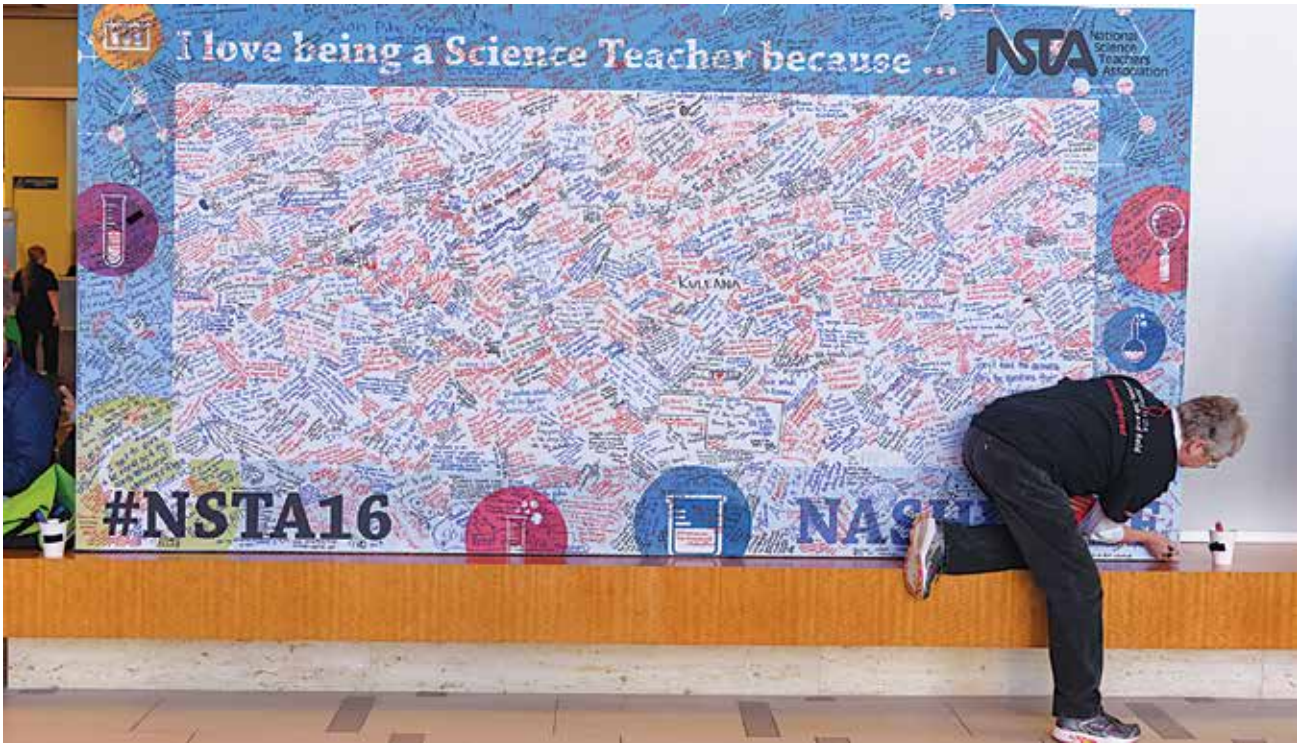
The museum is open on Thursdays from 10:00 AM to 8:00 PM and Friday–Sunday from 10:00 AM to 4:00 PM. The museum is located on the west shore of Lake Calhoun in a Tudor-Gothic–style mansion at 3537 Zenith Ave. S.

Join us for a weekend of special events including:

- **Thursday, Oct. 27, 5:30–9:00 PM**—Evenings@TheBakken Museum Exhibit Preview Party for *Mary and Her Monster—Mary Shelley and the World That Created Frankenstein* (includes food/drinks and artwork from illustrator Zak Sally). (21+ event)
- **Saturday, Oct. 29, 10:30 AM–3:30 PM**—Discovery Days will celebrate the public opening of *Mary and Her Monster* and provide hands-on STEM activities for visitors of all ages with partner Arizona State University and The Bakken Museum educators.

THE BAKKEN MUSEUM

NSTA National Science Teachers Association



Online Session Evaluations and Tracking Professional Development

All attendees can now evaluate sessions online while simultaneously tracking their professional development certification (based on clock hours).

Help NSTA's **GREEN** efforts by visiting the conference session browser to complete session evaluations online, October 27–November 15, 2016. During the conference, session evaluations can be completed on the computers at the Presenters/Presiders booth in the Registration Area. **And this year, we're giving away an Apple iPad mini 2 Wi-Fi tablet to one lucky attendee who completes a session evaluation! Remember, the more sessions you attend and evaluate, the more chances you have to win!**

To evaluate a session, attendees should follow these steps:

- Visit the conference session browser and search for part of the session title or presenter's name using the **Find Keyword** search option. *Note:* Our session evaluation system is designed to work from a computer and while it may work on smartphones/tablets, it is not really designed for them.
- Once you find the session you wish to evaluate, simply click the **Evaluate Session** button.
- Enter badge number (if you don't remember your badge number, click "help me find my badge number").
- When finished evaluating the session, click the **Submit Evaluation** button.
- Repeat this process for each session attended.

Concurrent session presenters may also complete evaluations for their own sessions in order to track professional development credit.

A Professional Development Documentation Form is included following page 32 to help attendees keep track of sessions/events attended that are NOT available for online session evaluation. This form can also be used to take notes on sessions attended that are available for online session evaluation.

Beginning November 22, 2016, an attendee can view his or her transcript at the NSTA Learning Center *(learningcenter.nsta.org)* by first logging on and then clicking "My Profile" under the Welcome. Here you'll find a "Certificates" tab, which you can use to access your transcript. Attendees can also document credit for activities that are not being evaluated (e.g., Exhibit Hall visits, etc.). In addition, the NSTA Learning Center offers professional development experiences (online and face-to-face) for your long-term growth and professionalism.

Each attendee is responsible for tracking his or her own attendance at such events. The transcript can be printed here and presented to an administrator who requires documentation of participation in the conference. All information in these transcripts will be maintained (and can be accessed) indefinitely as part of an attendee's individual profile.

Conference Resources

NSTA Membership Booth and the (UN)conference

Come by the membership booth to meet NSTA staff and board members to learn more about NSTA membership and become part of the group who is crafting the future of science education. Win great prizes, including airfare on Southwest Airlines to the 2017 NSTA Los Angeles National Conference on Science Education. We'll be handing out our new #ONLYatNSTA tweetshirts—come by and get one while supplies last! The membership booth is located in the Hall C lobby of the Convention Center.

Also in Minneapolis, we're debuting the NSTA (UN)conference, hosted by expert STEM educator, Dedric McGhee. Follow us on Twitter @NSTA or #NSTA16 to see updates!

Lost and Found

All lost-and-found items will be turned in at the Exhibitor Registration counter at the Convention Center.

Audiovisual Needs

NSTA will fulfill AV needs originally requested on the program proposals as long as the request is within the limits of equipment that NSTA provides. For any last-minute AV needs, presenters must arrange and pay for their own equipment. Audio Visual Production Solutions, the designated AV company on-site, will be located in the following rooms:

- 202 A/B, Convention Center
- Conrad B/C, Hilton

First Aid Services

The First Aid room is located in Lobby C of the Convention Center next to Dunn Brothers (look for the red cross). Should you require or know of a medical emergency, contact security at 612-335-6040 or dial 2013 on any house phone.

Special Offers at Local Museums

The Bakken Museum, Science Museum of Minnesota, and The Works Museum have extended special offers for Minneapolis conference attendees. Please see details listed on the ads on pages 10, 12, and 22.

Business Services

Located on the main floor across from the auditorium of the Convention Center, the UPS Store offers a variety of services, including photocopying, scanning, faxing, use of computer work stations, and same-day shipping. During the week of the conference, hours will be:

Monday–Friday	8:00 AM–5:00 PM
Saturday	10:00 AM–3:00 PM

For more information, please e-mail *store6479@theupsstore.com* or call 612-335-6295.

Located in the Hilton on the lobby level, the FedEx Office Business Center is a full-service center that offers a variety of services, including photocopying, scanning, faxing, use of computer work stations, signage banners, posters, and shipping. The center is open as follows:

Monday–Friday	7:30 AM–5:30 PM
Saturday & Sunday	closed

For details, please call 612-330-0300 or e-mail *usa5646@fedex.com*.

Information Desk

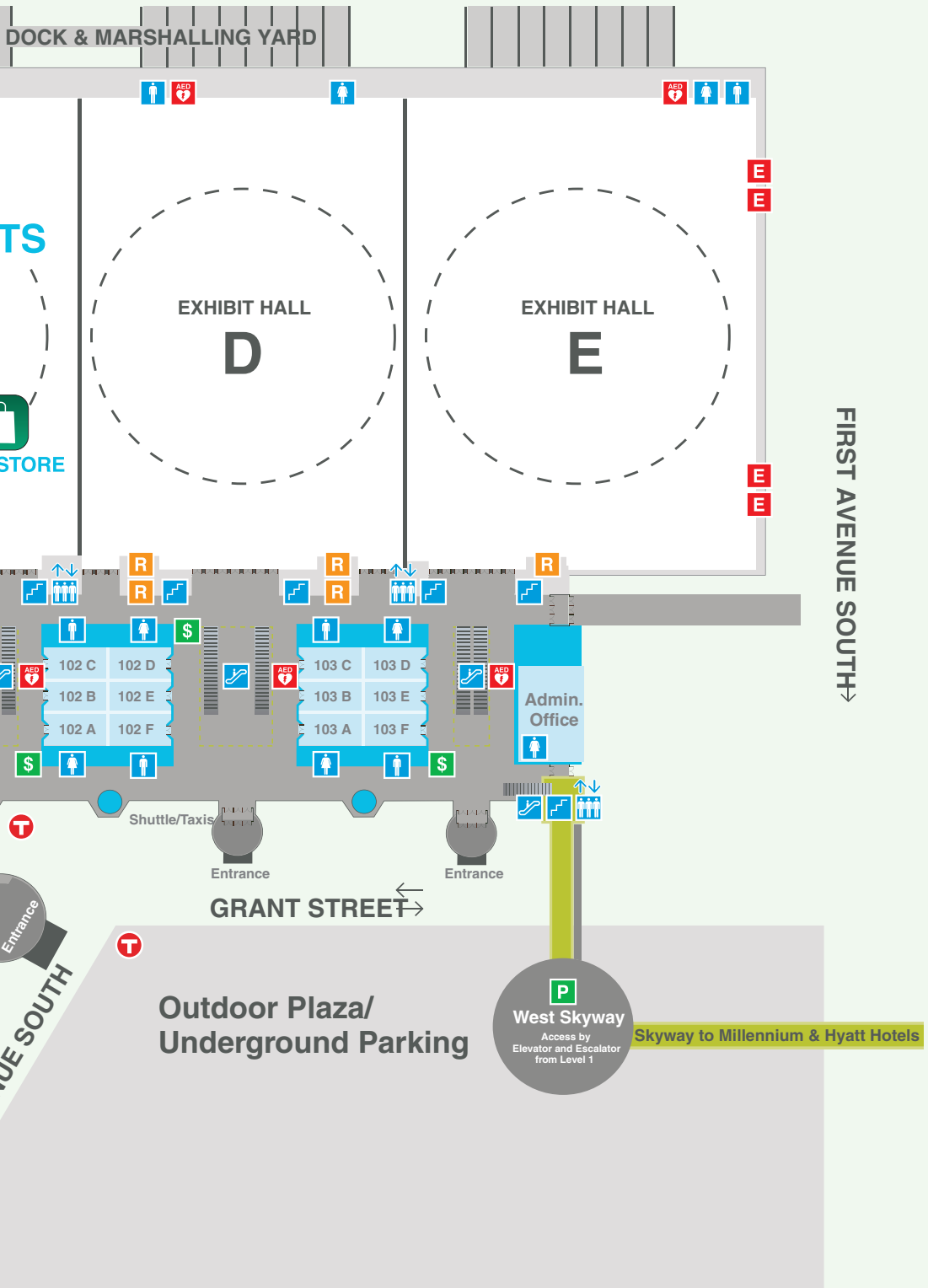
Meet Minneapolis has an information/restaurant booth located in the Hall C lobby in the Convention Center. It is open Thursday and Friday from 9:00 AM to 5:00 PM.

—*Photo courtesy of Claes Oldenburg and Coosje van Bruggen*

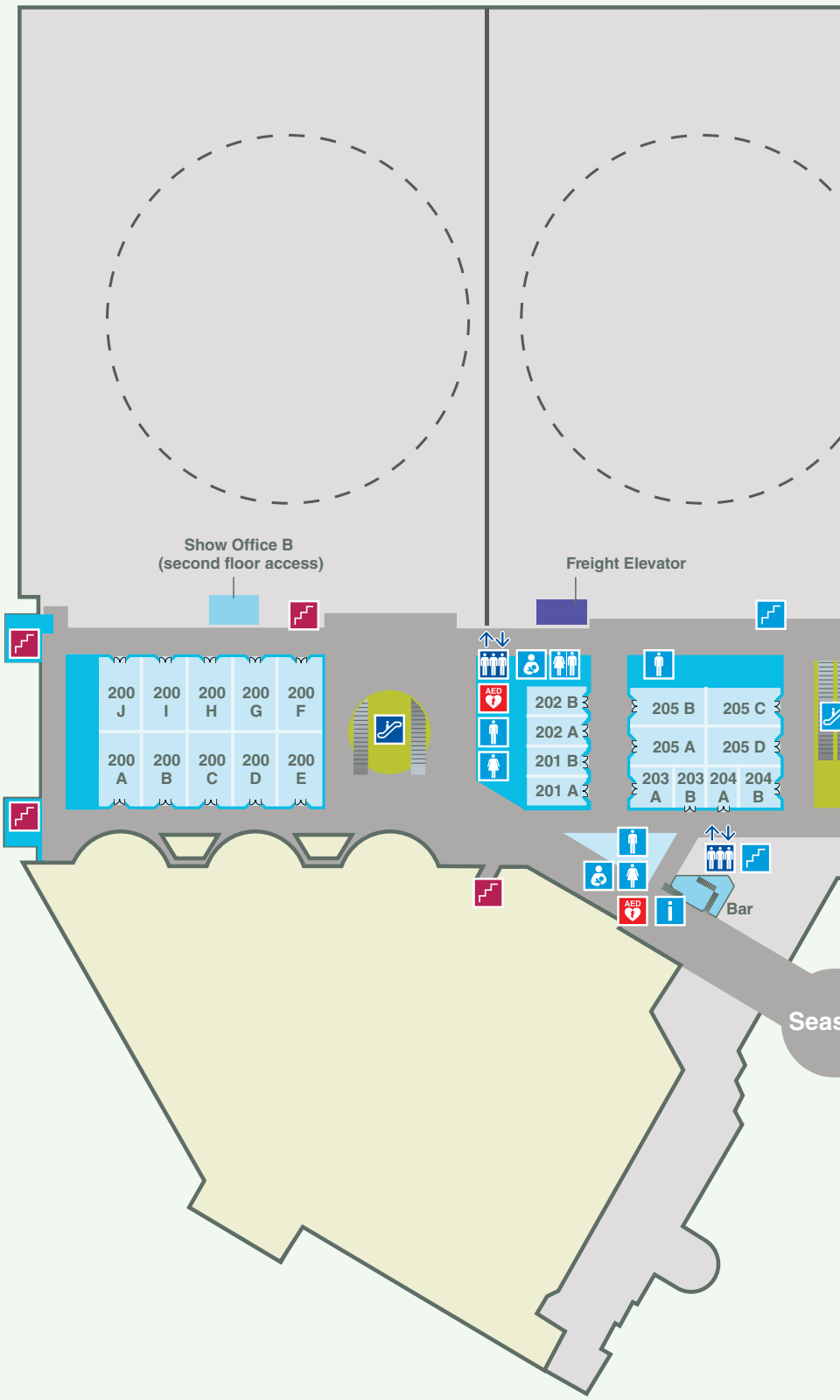
Level One

IMAGE NOT TO SCALE

nvention Center



Level Two


Show Office B
(second floor access)
Freight Elevator
200 J
200 I
200 H
200 G
200 F
200 A
200 B
200 C
200 D
200 E
202 B
202 A
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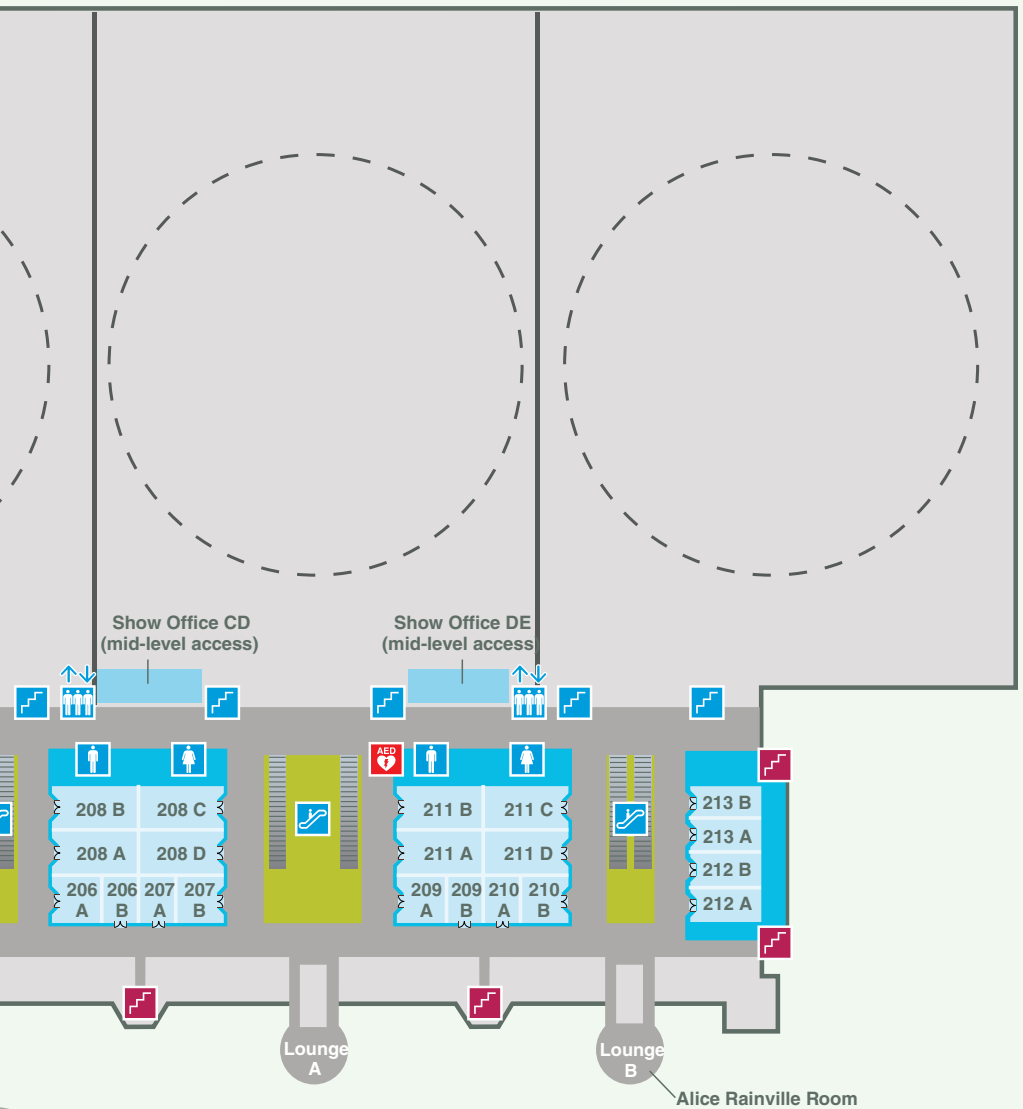

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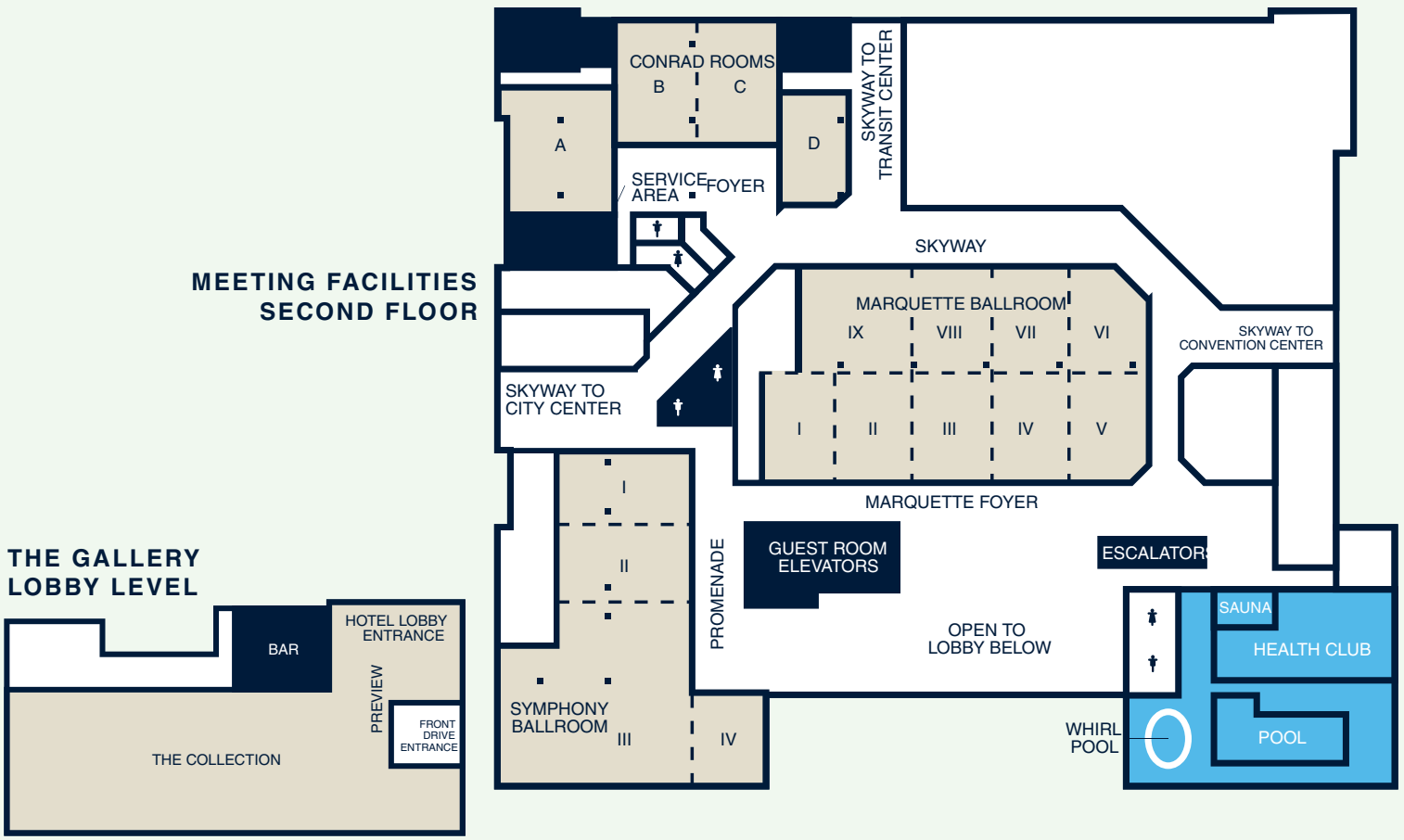
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BAR
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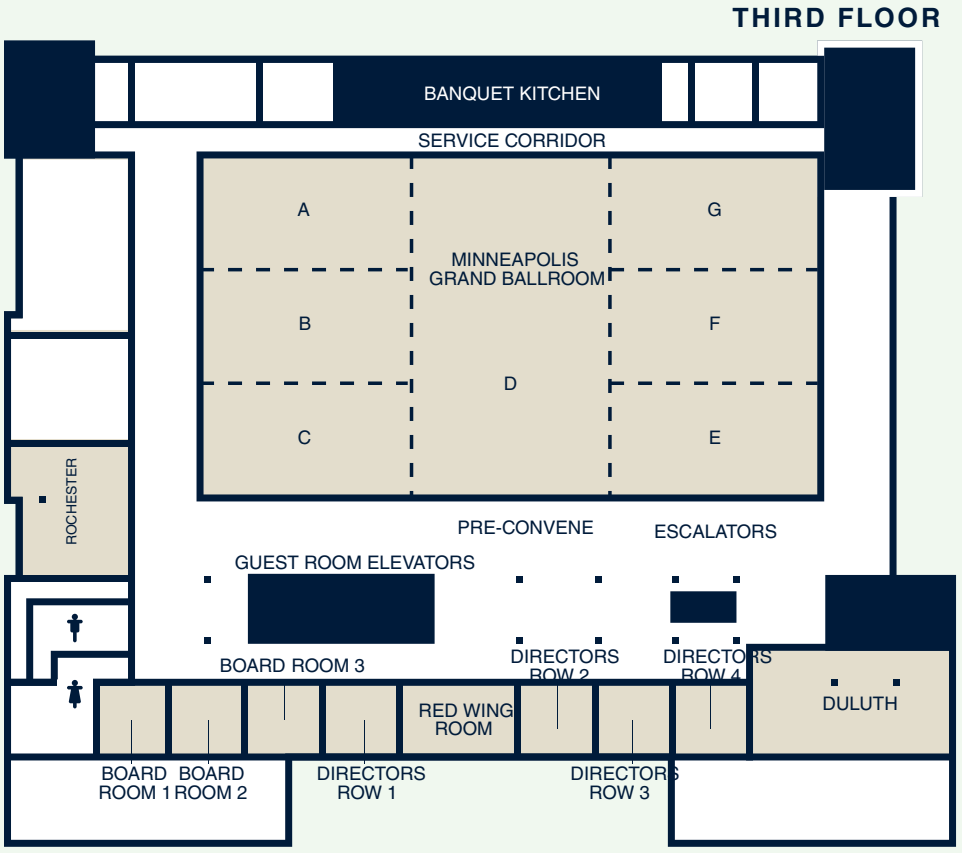
PREVIEW
FRONT DRIVE ENTRANCE
THE COLLECTION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RED WING
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NSTA Mission Statement

The mission of NSTA is to promote excellence and innovation in science teaching and learning for all.

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All cities are subject to change pending final negotiation.

National Conferences on Science Education

Los Angeles, California
March 30–April 2, 2017

Atlanta, Georgia
March 15–18, 2018

St. Louis, Missouri
April 11–14, 2019

Boston, Massachusetts
March 26–29, 2020

Chicago, Illinois
April 8–11, 2021

6th Annual STEM Forum & Expo, *hosted by NSTA*

Gaylord Palms Resort/Kissimmee, Orlando, Florida
July 12–14, 2017

Area Conferences on Science Education

2016 Area Conferences

Portland, Oregon—November 10–12
Columbus, Ohio—December 1–3

2017 Area Conferences

Baltimore, Maryland—October 5–7
Milwaukee, Wisconsin—November 9–11
New Orleans, Louisiana—November 30–December 2

NSTA NATIONAL CONFERENCE ON SCIENCE EDUCATION

"The conference provides a wealth of information from lesson plans to the latest science news. I leave each conference renewed and recharged!"

– **Sharon Ruggieri**, past conference attendee

Over **1,200** sessions

Network with more than **10,000** educators

375+ exhibitors with cutting-edge resources

And much more!

CONFERENCE STRANDS

NGSS The Next Generation of Science Teaching	2017 A STEM Odyssey	**Science & Literacy Reloaded**	**Mission Possible** Equity for Universal Access

Stay up-to-date with conference information at
www.nsta.org/la

NSTA National Science Teachers Association

—Courtesy of © Meet Minneapolis

Is This Your First NSTA Conference?

Yes, you say? Then you are invited to attend a special session on Thursday, 8:00–9:00 AM. Learn how you can gain the most from your conference experience and have fun doing it! See page 37 for details.

Thanks to the generosity of

Southwest Airlines

we're giving away three round-trip tickets on Southwest Airlines for educators to attend the NSTA National Conference in LA, March 30–April 2, 2017!

Southwest

The drawings will be held at:

- **4:00 PM,** Thursday, Oct. 27
- **2:00 PM,** Friday, Oct. 28
- **10:00 AM,** Saturday, Oct. 29

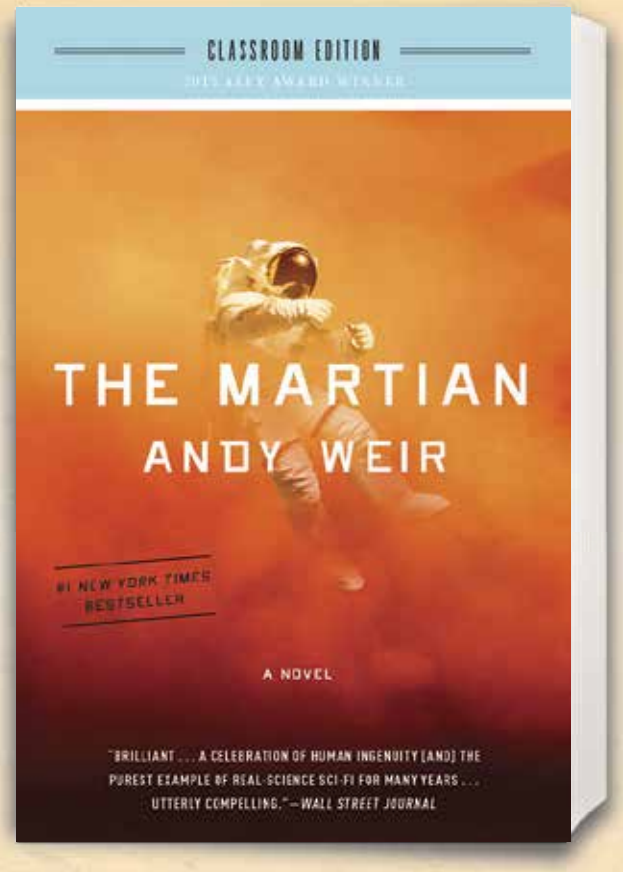
Stop by the NSTA Membership booth for all the details! You need not be present to win.

NSTA National Science Teachers Association

NEW CLASSROOM EDITION

"*The Martian* should be required reading for all middle and high school students, and it should serve as a call to action for improving science education."

—Jacqueline Miller, Ph.D., senior research scientist at Education Development Center (EDC) and Thomas Max Roberts, Ph.D., postdoctoral fellow in plasma physics at Dartmouth College



Broadway Books • TR
978-0-804-18935-4 • 400 pp.
$15.00 • Exam Copy: $3.00

B\D\W\Y

THE MARTIAN: A Novel

by ANDY WEIR

Set in the not-so-distant future, *The Martian* tells the story of astronaut Mark Watney, who is stranded on Mars after a mission failure leads his crew and NASA to assume he is dead. Using his background in botany and engineering, Watney must find a way to survive until he can contact NASA and they can arrange a rescue mission. Once NASA realizes that Watney is, in fact, alive, a race begins to save his life.

This new edition has:

- Classroom-appropriate language
- Discussion questions and activities
- Q&A with Andy Weir.

ANDY WEIR was first hired as a programmer for a national laboratory at age fifteen and has been working as a software engineer ever since. He is also a lifelong space nerd and a devoted hobbyist of subjects like relativistic physics, orbital mechanics, and the history of manned spaceflight. *The Martian* is his first novel. **www.AndyWeirAuthor.com**

To request a FREE CCSS Teacher's Guide, email highschool@penguinrandomhouse.com

To read an author message to educators, go to: tiny.cc/weiressay

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The Minneapolis Conference Committee has planned the conference around these three strands, enabling you to focus on a specific area of interest or need. Strand events are identified by icons throughout the daily program.

Teaching Science in a Connected World

Students and teachers have access to many forms of technology. These technologies can be effective tools to access information, deliver instruction, communicate ideas, connect with people from around the world, and build professional learning networks. Educators attending these sessions will explore instructional materials, technologies and strategies for effective learning for students and adults, and responsible use of digital resources and processes.

STEMify Instruction Through Collaboration Across the Curriculum

STEM can be a powerful unifying theme across the curriculum and in many settings. STEM provides an opportunity for collaboration among teachers, disciplines, and schools, as well as postsecondary, informal education, and community partners. Educators attending sessions in this strand will explore models of integrated STEM education programs, learn strategies to productively STEMify lessons, and investigate how to effectively engage students.

Celebrating Elementary Science and Literacy Connections

Children are born investigators. Science is an engaging way to develop students' skills in thinking creatively, expressing themselves, and investigating their world. Reading, writing, and speaking are inspired through science experiences. Educators attending these sessions will gain confidence in teaching science, learn strategies for literacy and science integration, and celebrate elementary science.

Teaching Science in a Connected World

Thursday, October 27

8:00–9:00 AM
Searching for Spielberg

12:30–1:30 PM
NASA Astrobiology: The Search for Life Beyond Earth

2:00–3:00 PM
The AMS DataStreme Project: Digital Earth Science Education for Teachers

5:00–6:00 PM
NASA's Eyes on the Solar System: Bringing the Planets to Your Classroom's Computers

Friday, October 28

8:00–9:00 AM
The Monarch Butterfly: Sophisticated Science

9:30–10:30 AM
Citizen Science: Projects and Activities to Engage Students in Authentic Science Research

11:00 AM–12 Noon
Featured Presentation: Wearable Technology and the Connected World
(Speaker: Lucy Dunne)

12:30–1:30 PM
Engaging Students in Science Through Virtual Field Trips

3:30–4:30 PM
Evolution for Educators

5:00–6:00 PM
Direct Measurement Video for Science Inquiry

Saturday, October 29

8:00–9:00 AM
Exploring the Trade-Offs and Payoffs of Sustainable Bioenergy Through Simulations and Field Data

9:30–10:30 AM
Dissecting Animals? Frog-get About It!

11:00 AM–12 Noon
Using News Media to Learn About Science in the Connected Science Classroom

STEMify Instruction Through Collaboration Across the Curriculum

Thursday, October 27

8:00–9:00 AM
Use NASA Design Challenges to Develop Critical Thinking and Grit

12:30–1:30 PM
Incorporating STEM Across the Curriculum Through Inquiry

Building Bridges: Engineering in the Elementary Classroom

2:00–2:30 PM
P3: A Statewide Program/Policy Partnership to Advance PreK–12 STEM Education

2:00–3:00 PM
Featured Presentation: Inclusive STEM Schools: Deconstructing and Determining the Success of a Complex Innovation
(Speaker: Melanie LaForce)

2:30–3:00 PM
Nano@Illinois Research Experiences for Teachers (RET)

3:30–4:30 PM
If They Make It, They Will Learn: The Maker Movement and K–12 STEM

5:00–6:00 PM
Inventing Is Just Plain Fun (for All)!

Friday, October 28

8:00–9:00 AM
Jackson Middle School: A Specialty School for Math and Science: Developing Confident, Critical Thinkers Through Inquiry and Integrated Learning Experiences

9:30–10:30 AM
STEMify Your Teaching Using Best Practices of STEM Education in Your Classroom

11:00–11:30 AM
Laser Cutters + 3D Printers + Vinyl Cutters = Bolstered K–3 Math Curriculum

12:30–1:30 PM
"Bee" STEMified: The Powerful Story of the Pollinator…Revealed Through Collaborative Effort

5:00–5:30 PM
The Transition—From STEM Student to STEM Teacher

Saturday, October 29

9:30–10:30 AM
Quake-Proof: Applying Newton's Laws of Motion to Building Design

11:00 AM–12 Noon
Engineering from Every Angle: Engineers as Proficient in Emotional Intelligence as Well as Analytical Skills

Celebrating Elementary Science and Literacy Connections

Thursday, October 27

8:00–9:00 AM
Native Plants and Seeds, Oh My!

12:30–1:30 PM
Featured Presentation: Taking Flight with Children's Literature
(Featured Speakers: Steve Rich and Christine Anne Royce)

2:00–3:00 PM
Three New Lessons for Early Childhood STEM Educators: Engineering (as) an Answer to a Need

3:30–4:30 PM
Developing and Implementing *NGSS*-Focused Curricula in Gillette, Wyoming: Strategies and Tools for Elementary Science and Literacy Integration

5:00–6:00 PM
Whoosh, Crack, Slide, and Crash Your Way into a Grade 5 Earth Science Unit

Friday, October 28

8:00–9:00 AM
"Bee" Wild About Pollinators

9:30–10:30 AM
Connecting the Skills of Literacy and Science Through Children's Literature and STEM Topics

11:00 AM–12 Noon
Understanding Seed Dispersal with Engineering Practices and Trade Books

12:30–1:30 PM
Science Notebooks—From Preservice to the Classroom

3:30–4:30 PM
Disciplinary Literacy and Reading in the Content Area of Science: Yes! You Can Do Both as an Elementary Teacher!

Saturday, October 29

8:00–9:00 AM
Science and Literacy in Action

9:30–10:30 AM
Reading, Writing, and Speaking Science

11:00 AM–12 Noon
Teach Students to Read Like Scientists!

Help us with your feedback...and get a chance for a free Apple iPad mini 2

We're giving you one more reason to evaluate conference sessions.

When you log on to *www.nsta.org/minneapolisbrowser* and fill out an evaluation by clicking on the "evaluate session" button below the session you attended, you get entered into a drawing for a chance to win an Apple iPad mini 2 Wi-Fi tablet *courtesy of the NSTA Conference Department*.

Your feedback helps us in creating the best conference experience for you and other attendees.

- **WE'RE GIVING AWAY an APPLE iPAD MINI 2 Wi-Fi TABLET**

- **CONFERENCE APP**

- Scan QR code below to access our NSTA Conference App.

NSTA Press Sessions

NSTA Press® books offer new classroom ideas and standards-based strategies, from Earth science to nanoscience and from preK to college. Join NSTA Press authors for these sessions linked to the topics of their books.

Thursday, October 27

12:30–1:30 PM — *Basic Data Literacy: Helping Your Students (and You!) Make Sense of Data*

3:30–4:30 PM — Inside or Out: The Perfect Place for Connecting Outdoor Science and Children's Trade Books

Friday, October 28

8:00–9:00 AM — Using Real-World Data to Promote Three-Dimensional Instruction

9:30–10:30 AM — *Argument-Driven Inquiry in Physical and Life Science: Lab Investigations for Grades 6–8*

11:00 AM–12 Noon — Argumentation in the Biology Science Classroom

12:30–1:30 PM — Reimagining the Science Department

Friday, cont.

3:30–4:30 PM — Phenomenon-Based Formative Assessment Probes

Argument-Driven Inquiry in Chemistry: Lab Investigations for Grades 9–12

Outdoor Science with Birds, Books, and Butterflies

Saturday, October 29

8:00–9:00 AM — *Argument-Driven Inquiry in Biology: Lab Investigations for Grades 9–12*

9:30–10:30 AM — Argumentation in the Physical Science/Physics Classroom

11:00 AM–12 Noon — Teaching for Conceptual Understanding in Science

Meetings and Social Functions

Thursday, October 27

MnSTA Social
Duluth, Hilton ..... 4:30–6:00 PM

Friday, October 28

Discover the *NGSS* Train-the-Trainer Workshop
By Separate Registration, Conrad A, Hilton.....8:00 AM–5:00 PM

CESI Board Work Session
Board Room 1, Hilton ..... 3:00–5:00 PM

Saturday, October 29

Discover the *NGSS* Train-the-Trainer Workshop
By Separate Registration, Conrad A, Hilton.....8:00 AM–5:00 PM

Chemistry Day at NSTA

Sponsored by the American Chemical Society Education Division

Energy as a Framework to Teach Chemistry at Multiple Levels
For Grades 9–12

Friday, October 28, 8:00 AM–5:00 PM
200H, Convention Center

Energy is a crosscutting concept in all of the science disciplines. It can be used within chemistry as a framework to help students understand the properties and behavior of substances at multiple levels. The three sessions of Chemistry Day are designed to analyze, discuss, and reflect on diverse instructional strategies that actively engage students in thinking about energy transfer issues in chemistry at the macroscopic, symbolic, particulate, and atomic levels.

We will also illustrate how to diagnose and formatively assess student understanding. While these sessions can each stand alone, participants who join us for the day will experience how teachers can use different science practices (design, modeling, and argumentation) to help students develop and apply an energy lens to describe, explain, and predict chemical properties and phenomena. This Day of Chemistry has been developed by the American Chemical Society High School Chemistry Professional Development Leadership Group.

8:00–10:00 AM	**Energy in Chemistry—A Macroscopic View**
10:30 AM–12:30 PM	**Energy in Chemistry—A Particulate View**
3:00–5:00 PM	**Energy in Chemistry—An Atomic View**

Middle School Chemistry Day

Sponsored by the American Chemical Society Education Division

Middle School Chemistry—Big Ideas About the Very Small

Friday, October 28, 9:30 AM–4:30 PM
200G, Convention Center

Come to one, two, or as many sessions as you like during this day of activities and information for teaching and learning middle school chemistry. Staff from the American Chemical Society will introduce participants to the free online resource *middleschoolchemistry.com.* Each of the four sessions will include hands-on activities and explanations from the website that participants can easily incorporate into their teaching to support their current textbook and curriculum. Handouts of the session activities will be available for all participants.

9:30–10:30 AM	**Solids, Liquids, Gases, and Changes of State**
11:00 AM–12 Noon	**Density: A Molecular View**
12:30–1:30 PM	**The Water Molecule and Dissolving**
3:30–4:30 PM	**Chemical Reactions: Breaking and Making Bonds**

Engineering Day at NSTA

Sponsored by the American Society for Engineering Education

Friday, October 28, 8:00 AM–4:30 PM
200I, Convention Center

The American Society for Engineering Education has put together a public/private partnership to develop ways of engaging elementary, middle school, and high school students and teachers in engineering. Participants will learn about innovative, hands-on, project-based engineering activities, courses, curriculum options, events, outreach programs, professional development, and competitions designed to increase the engineering and technological literacy of all students; encourage more and more diverse students to pursue engineering careers; and enable teachers to learn about and experience engineering. Presenters will share lessons learned and examples of inquiry and design activities that have been developed in partnership with K–12 science teachers for use in the classroom and in informal educational settings. The materials result from a collaboration of engineering educators and STEM professionals working with NASA, *Teachengineering.org,* Engineering is Elementary, and Colleges of Engineering across the nation who actively engage in K–12 engineering in collaboration with partner teachers and schools. All sessions will help teachers understand the new ETS Engineering Design portion of the *Next Generation Science Standards (NGSS).*

8:00–9:00 AM	**LED Projects for Teaching Electrical Concepts**
9:30–10:30 AM	**Fluid Power Builds Creative Careers**
11:00 AM–12 Noon	**Digital Electronics Demystified—From "0" to "1" in a Single Session**
12:30–1:30 PM	**Engineering Design: A Template for Critical Considerations in Integrated STEM Education**
3:30–4:30 PM	**ASEE's K–12 Outreach—Engineering, Go For It (eGFI), Teach Engineering, Link Engineering, and the National Science Digital Library**

Physics Day at NSTA

Sponsored by the American Association of Physics Teachers

Friday, October 28, 8:00 AM–4:30 PM
200F, Convention Center

The American Association of Physics Teachers offers a full day of physics content. Physics Day consists of interactive hands-on workshops and sessions covering important physics topics for today's world. Each of these workshops or sessions is organized by experienced science educators and designed to deal with hard-to-express concepts that can be immediately applied in your classroom.

8:00–9:00 AM	**30 Demos in 60 Minutes: High School**
9:30–10:30 AM	**30 Demos in 60 Minutes for Elementary and Middle School**
11:00 AM–12 Noon	**Physics on the Cheap**
12:30–1:30 PM	**Particle Physics in the Classroom**
3:30–4:30 PM	**Physics Make-and-Take Potpourri**

This form is for planning purposes only. Do NOT submit to NSTA.

Minneapolis Area Conference, October 27–29, 2016
Professional Development Documentation Form

All attendees can evaluate concurrent teacher and exhibitor sessions online while simultaneously tracking professional development certification (based on clock hours). Use this form to keep track of all sessions/events attended during the 2016 Minneapolis Area Conference. Sessions/events such as exhibit hall visits are not available for online evaluation. However, these events still qualify for professional development.

Beginning November 22, 2016, Minneapolis conference transcripts can be accessed at the NSTA Learning Center *(learningcenter.nsta.org)* by logging on with your conference badge ID# and first clicking on "My Profile" under the "Welcome." Here you'll find a "Certificates" tab to access your transcript. Keep this form and use it to add the following activities to your Minneapolis conference transcript. Completed transcripts can be printed from this website and presented to an administrator who requires documentation of participation in the conference. All information in these transcripts will be maintained (and can be accessed) indefinitely as part of an attendee's individual profile.

First Name: _____ **Last Name:** _____ **Badge ID#** _____

Evaluate sessions by accessing the Minneapolis session browser: *www.nsta.org/minneapolisbrowser*. You will need your badge number to evaluate sessions. See page 11 of the program for instructions. *Note:* Our session evaluation system is designed to work from a computer and while it may work on smartphones/tablets, it is not really designed for them.

Sample Questions:

1. I selected this session:
   a. for immediate classroom use.
   b. based on the reputation of the speaker.
   c. to improve my personal pedagogical knowledge/skill.
   d. to improve my STEM content knowledge.
2. The session met my needs.
3. The information presented was clear and well organized.
4. Safe practices were employed.
5. The session avoided commercial solicitation (n/a for exhibitor workshops and NSTA Press® sessions).
6. The session should be repeated at another NSTA conference.

Sample Responses:

1=Strongly Agree 2=Agree 3=Neutral 4=Disagree 5=Strongly Disagree

Thursday, October 27 8:00 AM–6:00 PM

Start Time	End Time	Activity/Event Title

Friday, October 28 8:00 AM–6:00 PM

Start Time	End Time	Activity/Event Title

Saturday, October 29 8:00 AM–5:00 PM

Start Time	End Time	Activity/Event Title

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Vernier *Celebrating 35 Years*

Association for Science Teacher Education (ASTE)

President: Lisa Martin-Hansen

Friday, October 28

9:30–10:00 AM	Milkweed Adaptation Distributed Research Project	Marquette IV, Hilton
11:00–11:30 AM	Using Corn as a Model Organism to Foster Students' Agricultural Literacy and Understanding of Plant Genetics	Marquette IV, Hilton

Council for Elementary Science International (CESI)

President: James T. McDonald

Thursday, October 27

3:30–4:30 PM	Elementary Science Share-a-Thon	Minneapolis E–G, Hilton

Friday, November 13

9:30–10:30 AM	Integrating Science for Young Children with an Outdoor Focus	Marquette IX, Hilton
3:00–5:00 PM	CESI Board Work Session	Board Room 1, Hilton

National Association for Research in Science Teaching (NARST)

President: Mary M. Atwater

Friday, October 28

12:30–1:30 PM	Making Sense of Student Sense Making in Oral Presentations of Independent Research Projects	Marquette IV, Hilton
3:30–4:00 PM	What Can I Do and How Do I Get There? Trajectories of Science Teacher Learning	Marquette IV, Hilton

National Middle Level Science Teachers Association (NMLSTA)

President: Diana Cost

Thursday, October 27

2:00–3:00 PM	Calling All Middle Level Teachers	Marquette V, Hilton

Friday, October 28

12:30–1:30 PM	Get Wet! Teaching Students About the Great Lakes Using Engineering Design	Marquette I/II, Hilton

National Science Education Leadership Association (NSELA)

President: Elizabeth Mulkerrin

Friday, October 28

9:30–10:30 AM	Tools for Science Leaders, Part 1	Marquette VIII, Hilton
11:00 AM–12 Noon	Tools for Science Leaders, Part 2	Marquette VIII, Hilton

Three Dimensions of the *Next Generation Science Standards (NGSS)*

Science and Engineering Practices

SEP1 Asking Questions and Defining Problems
SEP2 Developing and Using Models
SEP3 Planning and Carrying Out Investigations
SEP4 Analyzing and Interpreting Data
SEP5 Using Mathematics and Computational Thinking
SEP6 Constructing Explanations and Designing Solutions
SEP7 Engaging in Argument from Evidence
SEP8 Obtaining, Evaluating, and Communicating Information

Crosscutting Concepts

CCC1 Patterns
CCC2 Cause and Effect: Mechanism and Explanation
CCC3 Scale, Proportion, and Quantity
CCC4 Systems and System Models
CCC5 Energy and Matter: Flows, Cycles, and Conservation
CCC6 Structure and Function
CCC7 Stability and Change

Disciplinary Core Ideas

Disciplinary Core Ideas in Physical Science

PS1: Matter and Its Interactions
PS1.A: Structure and Properties of Matter
PS1.B: Chemical Reactions
PS1.C: Nuclear Processes

PS2: Motion and Stability: Forces and Interactions
PS2.A: Forces and Motion
PS2.B: Types of Interactions
PS2.C: Stability and Instability in Physical Systems

PS3: Energy
PS3.A: Definitions of Energy
PS3.B: Conservation of Energy and Energy Transfer
PS3.C: Relationship Between Energy and Forces
PS3.D: Energy in Chemical Processes and Everyday Life

PS4: Waves and Their Applications in Technologies for Information Transfer
PS4.A: Wave Properties
PS4.B: Electromagnetic Radiation
PS4.C: Information Technologies and Instrumentation

Disciplinary Core Ideas in Life Science

LS1: From Molecules to Organisms: Structures and Processes
LS1.A: Structure and Function
LS1.B: Growth and Development of Organisms
LS1.C: Organization for Matter and Energy Flow in Organisms
LS1.D: Information Processing

LS2: Ecosystems: Interactions, Energy, and Dynamics
LS2.A: Interdependent Relationships in Ecosystems
LS2.B: Cycles of Matter and Energy Transfer in Ecosystems
LS2.C: Ecosystem Dynamics, Functioning, and Resilience
LS2.D: Social Interactions and Group Behavior

LS3: Heredity: Inheritance and Variation of Traits
LS3.A: Inheritance of Traits
LS3.B: Variation of Traits

LS4: Biological Evolution: Unity and Diversity
LS4.A: Evidence of Common Ancestry and Diversity
LS4.B: Natural Selection
LS4.C: Adaptation
LS4.D: Biodiversity and Humans

Disciplinary Core Ideas in Earth and Space Science

ESS1: Earth's Place in the Universe
ESS1.A: The Universe and Its Stars
ESS1.B: Earth and the Solar System
ESS1.C: The History of Planet Earth

ESS2: Earth's Systems
ESS2.A: Earth Materials and Systems
ESS2.B: Plate Tectonics and Large-Scale System Interactions
ESS2.C: The Roles of Water in Earth's Surface Processes
ESS2.D: Weather and Climate
ESS2.E: Biogeology

ESS3: Earth and Human Activity
ESS3.A: Natural Resources
ESS3.B: Natural Hazards
ESS3.C: Human Impacts on Earth Systems
ESS3.D: Global Climate Change

Disciplinary Core Ideas in Engineering, Technology, and the Application of Science

ETS1: Engineering Design
ETS1.A: Defining and Delimiting an Engineering Problem
ETS1.B: Developing Possible Solutions
ETS1.C: Optimizing the Design Solution

ETS2: Links Among Engineering, Technology, Science, and Society
ETS2.A: Interdependence of Science, Engineering, and Technology
ETS2.B: Influence of Engineering, Technology, and Science on Society and the Natural World

Modeled after the Washington Monument in 1929, the Foshay Tower has 32 floors and stands 447 feet high, plus an antenna mast that extends the total height of the structure to 607 feet. This Art Deco skyscraper remained the tallest building in Minneapolis until the IDS Center surpassed it in 1972.

8:00–8:30 AM Presentation

Elementary STEM Fellowship

(Grades 1–6/College) *Conrad A, Hilton*

Science Focus: GEN, SEP1, SEP3

Bill Lindquist ((@wlind77; *wlindquist02@hamline.edu)* and **Robyn Char** *(robynchar@gmail.com),* Hamline University, Saint Paul, Minn.

Hear about a partnership that hosts a preservice teacher candidate as a STEM fellow in Crossroads Elementary School's nationally unique Inquiry Zone, leading directly into student teaching in the classroom.

8:00–9:00 AM Presentation

Do Children Aspire to STEM Careers?

(Grades K–5/College) *Marquette IV, Hilton*

Science Focus: ETS2

Donna Plummer *(donna.plummer@centre.edu),* Centre College, Danville, Ky.

Review findings from a five-year longitudinal study of elementary students' career aspirations via interviews that demonstrated students aspired to highly regarded professions, including STEM careers. Influences include family and media.

Spark Excitement for Science with Nonfiction Reading

(Grades 3–8) *Marquette V, Hilton*

Science Focus: GEN

Linda Linnen, Retired Teacher, Aurora, Colo.

Emphasis will be placed on best practices and strategies to use with science nonfiction content area readings. Lessons will be demonstrated on how to spark excitement for struggling readers.

Is This Your First NSTA Conference? First-Timer Conference Attendees' Orientation

(General) *Minneapolis B/C, Hilton*

Science Focus: GEN

NSTA Board and Council

Feeling overwhelmed by all there is to see and do at an NSTA conference on science education? Join us for an interactive exploration through the program, the conference app, and NSTA's social media. By the end of the session, you will know just how to get the most from your conference experience in addition to building new networks with science colleagues.

Science Area

A science area category is associated with each session. These categories are abbreviated on the Science Focus line for each session listing. On page 123, you will find the conference sessions grouped according to their assigned science area category.

The science areas and their abbreviations are:

LS = Life Science
PS = Physical Science
ESS = Earth and Space Science
ETS = Engineering, Technology, and the Application of Science
GEN = General Science Education
INF = Informal Science Education

NGSS

See page 35 for a complete list of the *NGSS* codes used in this program.

Strands

The Minneapolis Conference Committee has planned the conference around the following three strands, enabling you to focus on a specific area of interest or need. Strand events are identified by icons throughout the daily program. For strand descriptions, see page 26.

Teaching Science in a Connected World

STEMify Instruction Through Collaboration Across the Curriculum

Celebrating Elementary Science and Literacy Connections

The following icons will be used throughout this program.

NSTA Press® Sessions

NGSS@NSTA Forum Sessions

Developing Science Knowledge and Conceptual Understanding, Teaching Science Literacy Skills, and Engaging Students with Quality Nonfiction Science Books

(Grades K–6) *Rochester, Hilton*

Science Focus: GEN, NGSS

Donna Knoell *(dknoell@sbcglobal.net),* Educational Consultant, Overland Park, Kans.

Find out about the advantages of using science trade books to build science knowledge, teach science literacy skills, and provide a platform for investigations. Outstanding science trade books will be showcased as well as science literacy strategies. Handouts!

Searching for Spielberg

(Grades 7–College) *200C, Convention Center*

Science Focus: LS, PS, SEP

Amanda Meyer (@alynnmeyer; *alynnmeyer@gmail.com),* Springfield (Minn.) Public Schools

Jayme Fast (@FastJayme; *jaymefast@mountainlake.k12.mn.us),* Mountain Lake Public School, Mountain Lake, Minn.

Providing examples from physical and life science, as well as using multiple types of devices and apps, we will share how student-created videos can improve peer review and scientific communication, encourage critical thinking, and enhance data collection.

Freshwater Stewardship: Equip Your Student-Scientists with Cutting-Edge Resources from NOAA

(Grades 1–12) *200E, Convention Center*

Science Focus: ESS, CCC

June Teisan *(june.teisan@noaa.gov),* NOAA Office of Education, Washington, D.C.

Flooding. Water pollution. Freshwater is the lifeblood of our planet, and our future depends on the next generation of environmental stewards to preserve the health of watersheds. The National Oceanic and Atmospheric Administration (NOAA) has a wealth of online lesson plans, videos, data sets, webinars, and more to help inform and inspire students to action in research, stewardship, and resource management for vital freshwater ecosystems.

Polymer Food Chemistry: Have Fun with Polymer Chemistry by Making Mountain DewViar

(Grades 6–12) *200G, Convention Center*

Science Focus: PS1, CCC

Sherri Rukes (@polychemgirl; @sherrirukes; *sherri.rukes@d128.org),* Libertyville High School, Libertyville, Ill.

Polymers are found all around us. We will look at some of the various myths people have about cooking and learn how some of the "new techniques" of molecular gastronomy are done and how to create one in the classroom. Take home a CD of the activities and information.

Teaching Students to Ask Their Own STEM Questions

(General) *203 A/B, Convention Center*

Science Focus: GEN, SEP1

John Sessler *(sesslerjohn@gmail.com),* The Right Question Institute, Cambridge, Mass.

Allison Gest (@MrsGest; *agest@maine207.org),* Maine East High School, Park Ridge, Ill.

How can STEM educators cultivate students' question-asking skills? We will explore the Question Formulation Technique, which teaches students how to develop and use their questions.

Dazzling Deceptions: Discrepant Events That Delight and Mystify!

(Grades 4–College) *205 A/B, Convention Center*

Science Focus: GEN, NGSS

Alan McCormack *(amccorma@mail.sdsu.edu),* 2010–2011 NSTA President, and San Diego State University, San Diego, Calif.

Science experiences that seem contrary to "common sense" are great motivators for kids!

***NGSS* and SBG (Standards-Based Grading)…Together at Last!**

(Grades 9–12) *205D, Convention Center*

Science Focus: GEN, SEP

Allison Fuelling (@ajfuelling; *afuelling@marshallschools.org),* **Teri Boundy** (@MsBoundy; *tboundy@marshallschools.org),* **Danielle Bendt** *(dbendt@marshallschools.org),* **Joseph Wells** (@MrWellsMHS; *jwells@marshallschools.org),* and **Brian Sniff** (@principalsniff; *bsniff@marshallschools.org),* Marshall High School, Marshall, Wis.

Marshall High School has implemented SBG within our department over the past three years. Our *NGSS* practice-based rubric is used for all grade levels and science disciplines. We will share our products, process, struggles, and triumphs!

Designing and Using Formative Assessments in Science

(Grades 5–12) *206 A/B, Convention Center*

Science Focus: GEN, SEP4

Jennifer Rose *(jennifer.rose@mpls.k12.mn.us)* and **Julie Tangeman** *(julie.tangeman@mpls.k12.mn.us),* Minneapolis (Minn.) Public Schools

Formative assessments play a critical role in the science classroom. Learn how to design assessment questions to provoke student thinking and inform instruction.

8:00–9:00 AM Hand-On Workshops

Native Plants and Seeds, Oh My!

(Grades 3–6) *Marquette III, Hilton*

Science Focus: LS

Lauren Pauley, Becker Primary School, Becker, Minn.

Michele Hollingsworth Koomen *(mkoomen@gac.edu),* Gustavus Adolphus College, Saint Peter, Minn.

Kendra Carlson *(kendra.weege@outlook.org),* Schoolcraft Learning Community, Bemidji, Minn.

Cultivate new learning with a unit developed for upper elementary students that embeds reading and writing with a study of botany featuring native seeds and plants.

Use NASA Design Challenges to Develop Critical Thinking and Grit

(Grades 4–12) *200 A/B, Convention Center*

Science Focus: ESS, ETS1, SEP

Kathleen Fredette (@kathdette; *kathleen.fredette@ileadschools.org),* Maker School Network, Castaic, Calif.

Explore the engineering design process through NASA Design Challenges. Experience design challenges through Project-Based Learning, NASA curricula, and metacognitive practices that support authentic learning.

Need help navigating?

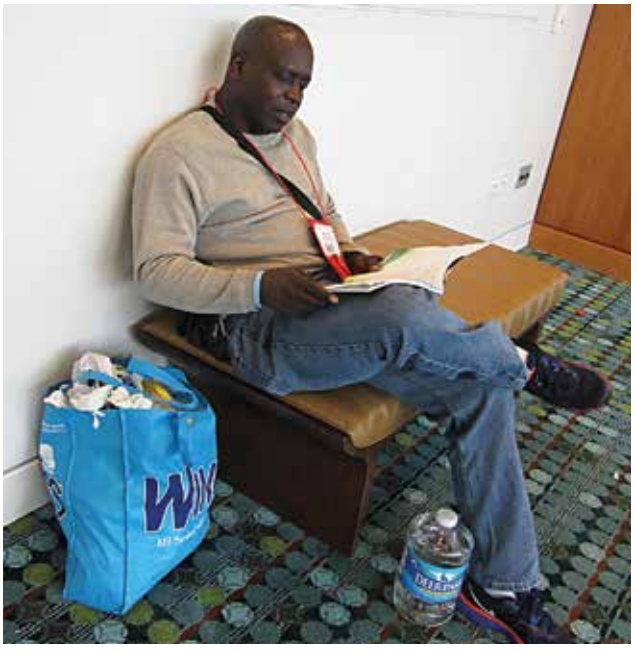
Feeling overwhelmed by all there is to see and do at an NSTA conference on science education? Join other first-time attendees for an interactive exploration through the conference program, the conference app, and NSTA's social media. By the end of the session, you will know just how to get the most from your conference experience in addition to building new networks with science colleagues.

First-Timer Attendee Session • Thursday, October 27, 8:00–9:00 AM
Minneapolis B/C, Hilton Minneapolis

NGSS and Climate Change for Middle School
(Grades 6–9) *200D, Convention Center*
Science Focus: ESS2.D, ESS3.C, ESS3.D, CCC1, CCC4, CCC7, SEP1, SEP4, SEP7
Jenna Totz (@climategenorg; *jenna@climategen.org),* Climate Generation: A Will Steger Legacy, Minneapolis, Minn.
Are you a middle school science teacher in a district adopting *NGSS?* Are you looking for curricular resources to help? Learn how Climate Generation can help you incorporate middle school climate change performance standards.

Stretch Your Legs for Science!
(Grades 1–12) *200I, Convention Center*
Science Focus: LS, INF
Kelly Schaeffer (@BirdSleuth; *kms448@cornell.edu),* The Cornell Lab of Ornithology, Ithaca, N.Y.
Explore citizen science via a mini bird walk. Enjoy a tutorial on bird identification, and experience how engaging and easy bird watching is!

High Five: Five Ways to Make Teaching Biotechnology Faster, Easier, and Cheaper
(Grades 7–College) *200J, Convention Center*
Science Focus: LS, CCC
Whitney Hagins, Massachusetts Biotechnology Education Foundation, Cambridge
Make biotechnology more hands on and manageable. From reagent prep to running gels and PCR, you and your students will love these innovative ideas and solutions.



8:00–9:00 AM Exhibitor Workshops

FOLD-tastic Science Notebooks via Dinah Zike's Notebook Foldables
(General) *101 I/J, Convention Center*
Science Focus: GEN
Sponsor: *Dinah.com*
John Elmer, *Dinah.com,* San Antonio, Tex.
Cut, fold, and more in this hands-on workshop as you construct Notebook Foldables that are sure to make your students' science notebooks FOLD-tastic. Use basic classroom materials and take home examples and ideas ready to use on Monday.

Experience Amplify Science: Grades K–1
(Grades P–2) *101A, Convention Center*
Science Focus: GEN, NGSS
Sponsor: Amplify
Rebecca Abbott *(amplifyscience@berkeley.edu)* and **Traci Shields** *(amplifyscience@berkeley.edu),* The Lawrence Hall of Science, University of California, Berkeley
Immerse yourself in Amplify Science, a new curriculum developed by University of California Berkeley's Lawrence Hall of Science. Experience the program's rich, multi-modal, and problem-based approach. See how your K–1 students will engage with deep dives into understanding the natural and designed worlds.

CPO's Link™ with Car and Ramp: Force, Motion, and Variables
(Grades 6–12) *101C, Convention Center*
Science Focus: PS2
Sponsor: CPO Science/School Specialty Science
Erik Benton, CPO Science/School Specialty Science, Nashua, N.H.
Kat Mills, School Specialty Science, Rosharon, Tex.
Learn to distinguish between dependent, manipulated, resultant, controlled, and independent variables. In this hands-on workshop, students discover variables while designing their own experiment. We will feature the Link learning module for car and ramp as we present a new "angle" on how to master confusing terminology using scientific investigations.

Wave Properties and Information Transfer
(Grades 6–8) *101D, Convention Center*
Science Focus: PS4
Sponsor: Delta Education/School Specialty Science–FOSS
Virginia Reid and **Jessica Penchos,** The Lawrence Hall of Science, University of California, Berkeley
Engage in activities using lasers and optical fibers in the new FOSS Next Generation Edition Waves Course for Middle School. Explore properties of refraction and reflection that allow information transfer by fiber optic technology, and identify connections to the three dimensions of *NGSS.*

Teach Next Gen Like Your Hair Is on Fire!
(Grades K–2) *101E, Convention Center*
Science Focus: GEN, NGSS
Sponsor: Delta Education/School Specialty Science
Darrick Wood, Distance Learning Coordinator, Louisville, Ky.
Kathy Armstrong, Northside Elementary School, Midway, Ky.
Become legendary in your own time when you teach science in your classroom. Experience lessons from Delta Science Modules that incorporate the *NGSS.* Receive corresponding content readers, strategies, and resources that you can take back and use with your students next week.

Waves, Waves, Waves: Building Models to Explain Phenomena
(Grades K–5) *101F, Convention Center*
Science Focus: PS4
Sponsor: Carolina Biological Supply Co.
Carolina Teaching Partner
The phenomena of waves can be explained by children through model building. Explore examples of how elementary students can share their learning of how waves work through modeling. Discover how the new Carolina Building Blocks of Science leads to student success in only 30 minutes a day.

Gas Exchange
(Grades 6–8) *101G, Convention Center*
Science Focus: LS1, PS3, CCC1, CCC4, SEP3, SEP5
Sponsor: LAB-AIDS®, Inc.
Judy Stier, Silverbrook Intermediate School, West Bend, Wis.
Teachers know their students have many misconceptions about respiration. In this activity from the SEPUP middle level life science program, participants use an acid-base indicator to determine the relative amount of carbon dioxide gas in a sample of their exhaled breath. They consider differences in individual response, explore qualitative vs. quantitative measures, and examine the structure of the lungs and their role in the process of respiration.

Martian Genetics
(Grades 6–College) *101H, Convention Center*
Science Focus: LS
Sponsor: Edvotek Inc.
Brian Ell and **Maria Dayton,** Edvotek Inc., Washington, D.C.
Explore genetics with our "out of this world" workshop! Imagine being the first scientist to explore Mars and discovering extraterrestrials. How would you use biotechnology to learn about the Martians? Discover how DNA technology can be used to explore the relationship between genotype and phenotype. Fluorescent dyes simulate DNA fragments, eliminating post-electrophoresis staining and saving classroom time! Take home a free gift and entry in a LabStation™ giveaway.

Bring Science to Life Through Elementary Robotics with LEGO Education WeDo 2.0
(Grades 2–4) *102C, Convention Center*
Science Focus: ESS, ETS, LS, PS
Sponsor: LEGO Education
Kathy Grotta *(kathy.grotta@lego.com),* LEGO Education, Boston, Mass.
Looking for more project-based lessons for your elementary science classroom? Come explore the new WeDo 2.0, which combines core science concepts with robotics to bring your science classroom to life. The WeDo 2.0 curriculum includes getting started, guided practice, and open-ended projects presented through an interactive software that teaches programming. Build a robot and explore the software, including a look at the documentation tool. Attendees will NEED to have WeDo 2.0 software downloaded to device before workshop! For Android, Chromebook, and iPad, go to app store and look for LEGO Education WeDo 2.0 FULL. For Mac and PC, go to *education.lego.com/en-us/educationdownloads.*

9:15–10:30 AM General Session

Why We Need More People to Ask Why

(General) *Ballroom A, Convention Center*

Science Focus: GEN

Ainissa Ramirez (@ainissaramirez), Scientist, Educator, and Science Evangelist, Conn.

Presider and Introduction: Mary Gromko, NSTA President, Colorado Springs, Colo.

Platform Guests: Ainissa Rodriguez; Mary Gromko; Carolyn Hayes, NSTA Retiring President, and Retired Educator, Greenwood, Ind.; David Crowther, NSTA President-Elect, and University of Nevada, Reno; Brenda Walsh, NSTA Director, District IX, and Eden Prairie High School, Eden Prairie, Minn.; Michele Hollingsworth Koomen, President, Minnesota Science Teachers Association, and Gustavus Adolphus College, Saint Peter, Minn.; Jean Tushie, Chairperson, NSTA Minneapolis Area Conference, and Eden Prairie High School, Eden Prairie, Minn.; Lee Schmitt, Program Coordinator, NSTA Minneapolis Area Conference, Lakeville; John Olson, Local Arrangements Coordinator, NSTA Minneapolis Area Conference, NSTA Director, Coordination and Supervison of Science Teaching, and Minnesota Dept. of Education, Roseville; David L. Evans, NSTA Executive Director, Arlington, Va.

Every year, five million kindergartners enter school armed with the word, "why." However, by the time they leave school, just a few years later, those "whys" grow silent. Scientists ask why for a living, but whys are not just for them. Everyday people need to ask why as well, so that they can learn about the world around them and make informed decisions. This talk will make a case for asking why and will share STEM strategies to keep those "whys" aglow in students.

Ainissa Ramirez *is a science evangelist and science lecturer, passionate about getting kids of all ages excited about science. She is dedicated to sharing the joy of materials, process, and creativity with students of all ages. At Yale, Ainissa is the founder of* Science Saturdays, *the award-winning science lecture series for children. She has served as a science advisor to WGBH/NOVA,* National Geographic, Time *magazine, and the American Film Institute. Currently, she is writing a book on the role of materials in history and co-hosts a science podcast called Science Underground.*

Prior to taking on the call to improve science understanding, Ainissa was an associate professor of mechanical engineering and materials science at Yale University, leading a research program in smart materials and nanomaterials.

9:30–10:30 AM Presentation

Learning from Writing

(Grades P–5) *Rochester, Hilton*

Science Focus: GEN, SEP1, SEP2, SEP3, SEP4, SEP6, SEP8

Cathy Kindem (@CJKindem), Rosemount-Apple Valley-Eagan Public Schools, Rosemount, Minn.

Carole Velasquez, Cedar Park Elementary STEM School, Rosemount, Minn.

Writing offers students a unique opportunity to uncover and refine learning. Explore various tools for writing and learning in K–5 integrated science units of study.

9:30–10:30 AM Exhibitor Workshops

Year-Round Solutions for Success in AP Chemistry from Flinn Scientific

(Grades 9–12) *101 I/J, Convention Center*

Science Focus: PS

Sponsor: Flinn Scientific, Inc.

Jillian Saddler, Flinn Scientific, Inc., Batavia, Ill.

Join Flinn as they present new guided inquiry experiments that support the learning objectives and skills your students need. Discover the benefits of preparing students for the first day of class with FlinnPREP™, an online review of foundational chemistry concepts. Handouts!

Experience Amplify Science: Grades 2–5

(Grades P–5) *101A, Convention Center*

Science Focus: GEN

Sponsor: Amplify

Rebecca Abbott *(amplifyscience@berkeley.edu)* and **Traci Shields** *(amplifyscience@berkeley.edu),* The Lawrence Hall of Science, University of California, Berkeley

Immerse yourself in Amplify Science, a new curriculum developed by University of California Berkeley's Lawrence Hall of Science. Experience the program's rich, multimodal, and problem-based approach. See how your grades 2–5 students will engage with deep dives into understanding the natural and designed worlds.

Solving the Mystery of STEM Using Forensic Science

(Grades 6–12) *101C, Convention Center*

Science Focus: GEN, NGSS

Sponsor: Frey Scientific/School Specialty Science

Erik Benton, CPO Science/School Specialty Science, Nashua, N.H.

Kat Mills, School Specialty Science, Rosharon, Tex.

Conduct STEM-focused, beginning forensic activities that connect scientific investigations to analysis and investigative skills. Solve "cases" involving fingerprinting, blood spatter,

and document or fabric analysis. We'll use a digital learning environment with simple supplies to apply basic mathematic principles, plus integrate reading and writing strategies.

Engage Students in FOSS Next Generation
(Grades K–5) *101D, Convention Center*
Science Focus: GEN, NGSS
Sponsor: Delta Education/School Specialty Science–FOSS
Diana Velez and **Brian Campbell,** The Lawrence Hall of Science, University of California, Berkeley
Join FOSS developers to learn about the FOSS Next Generation Elementary Program. We'll introduce the instructional design and illustrate how the system incorporates science-centered language development, notebooks, digital resources, formative assessments, and outdoor excursions into a coherent learning experience for students and teachers.

SEPs Made Easy
(Grades 2–5) *101E, Convention Center*
Science Focus: GEN, SEP
Sponsor: Delta Education/School Specialty Science
Darrick Wood, Distance Learning Coordinator, Louisville, Ky.
Kathy Armstrong, Northside Elementary School, Midway, Ky.
Experience lessons from Delta Science Modules that incorporate science and engineering practices. Receive corresponding content reader, strategies, and resources that you can take back and use with your students next week.

Engineer Excitement in Your Classroom with a Carolina STEM Challenge®
(Grades 6–12) *101F, Convention Center*
Science Focus: LS, PS
Sponsor: Carolina Biological Supply Co.
Carolina Teaching Partner
Bounce and race into hands-on activities that engage middle school and high school students. Apply creative problem-solving skills and engineering practices to chemistry and physical science challenges. Experience how Carolina makes it easy to bring STEM to your classroom.

Modeling Convection Currents and Plate Motion
(Grades 6–8) *101G, Convention Center*
Science Focus: ESS2.A, CCC3, CCC4, CCC5, SEP2, SEP3, SEP4, SEP6
Sponsor: LAB-AIDS®, Inc.
Judy Stier, Silverbrook Intermediate School, West Bend, Wis.
Investigate and model convection currents using unique LAB-AIDS/SEPUP materials to develop an operational understanding between water temperature and its movement. The hands-on experience with convection in water coupled with the knowledge of Earth's interior is combined to explain the motion of tectonic plates and how that motion causes major geological events.

Left at the Scene of the Crime: Introduction to Forensic Science
(Grades 6–College) *101H, Convention Center*
Science Focus: LS
Sponsor: Edvotek Inc.
Brian Ell and **Maria Dayton,** Edvotek Inc., Washington, D.C.
Explore genetic diversity using forensic science! Come learn how your students can become crime scene investigators as they analyze biological evidence using DNA fingerprinting, a technique that identifies people via genetic differences. Gel electrophoresis is used to create DNA fingerprints from crime scene and suspect samples. A match between samples suggests which suspect committed the crime. Receive a free gift for attending.

Earth and Space Science for the Modern, Interactive Classroom
(Grades 5–12) *102 A/B, Convention Center*
Science Focus: ESS1, ESS2.B
Sponsor: Simulation Curriculum Corp.
Michael Goodman and **Herb Koller,** Simulation Curriculum Corp., Minnetonka, Minn.
Join us on the big screen as we demonstrate the acclaimed *Starry Night* and *Layered Earth* lessons, exercises, stunning simulations, animations, and images. These complete curriculum solutions for Earth and space science from grades 5 to 12 are all now available for Chromebook, Windows, Mac OS, iPads, or Android tablets.

Using Maggots, Flies, and Flesh to Solve a Mystery!
(Grades 6–12) *102 E/F, Convention Center*
Science Focus: GEN
Sponsor: Texas Instruments
Jeffrey Lukens, Sioux Falls (S.Dak.) School District
A decomposing corpse is found in a field. Four possible missing persons fit the description. But who is it? Using clues near the scene will help determine identity. Forensic anthropologist and director of the human ID lab of Colorado, Dr. Diane France helped to develop this free middle school and high school forensic science lesson.

Integrating Literacy and Science—The Wow Factor
(Grades P–5) *102C, Convention Center*
Science Focus: GEN, SEP7
Sponsor: Activate Learning
Ellen Mintz, Charleston County School District, Charleston, S.C.
Come engage in a hands-on investigation where your students explore, read, write, talk, and think critically about science. Address reading, writing, and math through science investigations. Create data tables and argue from evidence, as you give your students a reason to write beyond just "fill in the blank."

11:00 AM–12 Noon Exhibitor Workshops

An *NGSS* Approach to Engineering in the Upper Grade Bands
(Grades 6–12) *101 I/J, Convention Center*
Science Focus: ETS, SEP2, SEP3, SEP7
Sponsor: Houghton Mifflin Harcourt
Michael DiSpezio, Author and STEM Specialist, North Falmouth, Mass.
Join educator, broadcast host, and Houghton Mifflin Harcourt author Michael DiSpezio for an engaging and informative workshop that addresses the *NGSS* approach to engineering and the engineering design process in the upper grade bands. In this hands-on session, you will work in multidisciplinary teams as you participate in several activities that profile and address a standards-based approach to engineering.

Experience Amplify Science: Middle School
(Grades 6–8) *101A, Convention Center*
Science Focus: GEN, NGSS
Sponsor: Amplify
Rebecca Abbott *(amplifyscience@berkeley.edu)* and **Traci Shields** *(amplifyscience@berkeley.edu),* The Lawrence Hall of Science, University of California, Berkeley
Immerse yourself in Amplify Science, developed by University of California Berkeley's Lawrence Hall of Science. Experience the program's technology-enhanced and problem-based approach. See how your grades 6–8 students will engage with deep dives into understanding the natural and designed worlds.

CPO's Link™ Genetics Learning Modules: Crazy Chromosomes and Crazy Traits
(Grades 6–12) *101C, Convention Center*
Science Focus: LS
Sponsor: CPO Science/School Specialty Science
Erik Benton, CPO Science/School Specialty Science, Nashua, N.H.
Kat Mills, School Specialty Science, Rosharon, Tex.
CPO Science's Link learning modules for genetics use *NGSS* strategies in a real-time digital learning environment. Students can study the relationship between DNA, genes, mitosis, meiosis, traits, alleles, phenotypes, and genotypes. Heredity comes alive as you use hands-on models to create crazy creatures in a unique collaborative program.

The Reflective Assessment Practice: Improving Science Achievement in 10 Minutes

(Grades K–5) *101D, Convention Center*

Science Focus: GEN

Sponsor: Delta Education/School Specialty Science–FOSS

Kathy Long, The Lawrence Hall of Science, University of California, Berkeley

Join FOSS developers to learn how assessment can become an integrated teaching tool that both teachers and students can embrace. Create a classroom culture of self-motivation and growth mind-set by just adding a 10-minute reflective practice to your day.

Build Skills to Boost the Makerspace Experience for Young Scientists!

(Grades K–5) *101E, Convention Center*

Science Focus: ETS

Sponsor: Delta Education/School Specialty Science

Kathy Armstrong, Northside Elementary School, Midway, Ky.

Darrick Wood, Distance Learning Coordinator, Louisville, Ky.

Makerspaces are popping up everywhere, providing a creative space to explore questions and solve problems. But for students in grades K–3, tackling STEM-related challenges requires a foundation in science investigation. Help young scientists build the skills needed for independent exploration in their makerspaces with programs like Science in a Nutshell.

Carolina's Young Scientist™ Dissections with Carolina's Perfect Solution® Specimen

(Grades K–5) *101F, Convention Center*

Science Focus: LS

Sponsor: Carolina Biological Supply Co.

Carolina Teaching Partner

Transform your students into young scientists when you bring these simple hands-on dissections to your classroom! We will guide you through the dissections of a squid and a frog, promoting classroom discussions of easily observable adaptations and the relationship between structure and function.

Calling All Carbons

(Grades 9–12) *101G, Convention Center*

Science Focus: ESS2.A, SEP2, SEP3, SEP4

Sponsor: LAB-AIDS®, Inc.

Jennifer Boldt, Solon High School, Solon, Iowa

The element of carbon is critical to life on Earth. All living organisms contain different and essential carbon-based molecules. Several Earth processes work together to cycle carbon from one carbon reservoir to another and to keep the amount in each reservoir stable. Join us to learn about and model different carbon transfer processes.

Exploring the Genetics of Taste: SNP Analysis of the PTC Gene Using PCR

(Grades 9–College) *101H, Convention Center*

Science Focus: LS

Sponsor: Edvotek Inc.

Brian Ell and **Maria Dayton,** Edvotek Inc., Washington, D.C.

Explore the relationship between genotype and phenotype using Phenylthiocarbamide (PTC). Some think PTC tastes bitter, while others find it tasteless. The ability to taste PTC has been linked to variations in a taste receptor gene. Learn how to use PCR to distinguish between PTC alleles. Receive a free gift for attending.

The Value of Writing Scientific Explanations in STEM

(Grades K–12) *102 A/B, Convention Center*

Science Focus: GEN, NGSS

Sponsor: Accelerate Learning–STEMscopes

Sharry Whitney *(swhitney@acceleratelearning.com),* Accelerate Learning–STEMscopes, Houston, Tex.

Claim-Evidence-Reasoning (CER) is a way for students to explain, in a scientific way, how their observations and data from an investigation are connected to science knowledge. Using a CER framework provides a scaffold for building the skill of argumentation and writing scientific explanations.

Dive In with Magnetic Water Molecules

(Grades 5–College) *102 E/F, Convention Center*

Science Focus: PS, SEP2, SEP5

Sponsor: 3D Molecular Designs

Tim Herman *(herman@msoe.edu),* MSOE Center for BioMolecular Modeling, Milwaukee, Wis.

Engaging water molecules enable you to use an inquiry approach to explore why water is essential for life. Discover the physical and chemical properties of water, states of matter, evaporation, condensation, transpiration, erosion, and more, using interactive water molecules with embedded magnets that mimic the polar interactions in real water.

11:00 AM–5:00 PM Exhibits

Hall C, Convention Center

Did you know that NSTA offers Exclusive Exhibits Hall hours today from 11:00 AM to 12:30 PM? During these hours there are no teacher sessions scheduled and it's a perfect time to visit the exhibits and discover all the products and services companies and organizations have to offer. Some exhibitors will offer materials for sale throughout the conference.

12:30–1:30 PM Featured Presentation

Taking Flight with Children's Literature

(Grades P–5) *205 A/B, Convention Center*

Science Focus: GEN

Speakers

Steve Rich (@bflyguy; *bflywriter@comcast.net),* Methods Instructor, University of West Georgia, Carrollton

Christine Anne Royce (@caroyce; *caroyce@aol.com*), Professor/Chairperson, Dept. of Teacher Education, Shippensburg University, Shippensburg, Pa.

Presider: Polly Saatzer, Celebrating Elementary Science and Literacy Connections Strand Leader, and Teacher, Garlough Environmental Magnet School, West Saint Paul, Minn.

Regardless if science is taught in a classroom, at home, or outdoors, in a formal or informal setting; a trade book can be a source of inspiration, curiosity, and information for children. A good story can serve as a catalyst for future questions, ideas, and learning opportunities. With that in mind, teachers can capitalize on the use of trade books by maximizing instructional time and allowing trade books to serve as a bridge between many different skill and content areas. Join us as we examine strategies and provide examples of varying ways to integrate science content with children's trade books. Throughout the presentation, we will connect some featured and favorite trade books to certain literacy strategies in order to help students learn science content.

Steve Rich *writes books based on his experiences as a teacher, state science specialist, nature enthusiast, and as a father. He is the author of books for teachers and students, including his popular NSTA Press® titles* Outdoor Science: A Practical Guide *and the follow-up,* Bringing Outdoor Science In: Thrifty Classroom Lessons.

Christine Anne Royce *is department chairperson and a professor in the Department of Teacher Education at Shippensburg University. She serves in a variety of roles for NSTA, including being co-author for* Science & Children's *"Teaching Through Trade Books" column. Christine's research interests focus on the use of children's literature to teach elementary science, science literacy issues, and Earth science and astronomy education in the classroom.*

12:30–1:30 PM Presentations

Integrating STEM into Your Curriculum Through a Gardening Project

(Grades P–K) *Marquette IV, Hilton*

Science Focus: GEN

Corinne Greenberg *(codag@aol.com),* Santa Fe College, Gainesville, Fla.

Plot new learning in your classroom with STEM activities that you can int egrate into your curriculum. STEM activities can make learning very exciting for young children.

Tracking Change Over Time: Earth Imagery in the Classroom

(Grades 4–9) *Marquette V, Hilton*

Science Focus: ESS3.B, ESS3.C, PS4.B

Tom Adamson *(thomas.adamson.ctr@usgs.gov),* Stinger Ghaffarian Technologies, Inc., Sioux Falls, S.Dak.

View a demonstration of a lesson plan that uses the free software MultiSpec to show middle school students how to analyze Landsat satellite images.

Decorating with Scientists or Using Research to Humanize Scientists

(Grades 1–12) *Marquette VIII, Hilton*

Science Focus: GEN

Daniel Larson *(djwerl@aol.com),* Retired Teacher, Plymouth, Minn.

This project started as a way to decorate our science hallway and have students do some research. It evolved into something that helps humanize scientists by the students choosing, researching, creating a poster, and then writing a short biography.

NGSS@NSTA Forum Session: Developing Coherent Storylines of *NGSS* Lessons

(Grades K–12) *Minneapolis B/C, Hilton*

Science Focus: GEN, NGSS

Brian Reiser (@reiserbrianj; *reiser@northwestern.edu),* Northwestern University, Evanston, Ill.

This session will explore how to develop a coherent storyline for a unit where instead of students *learning about* science ideas, they are motivated by questions arising from phenomena to *figure out these ideas* and, in the process, incrementally build explanatory models.

NASA Astrobiology: The Search for Life Beyond Earth

(Grades 9–College) *200 A/B, Convention Center*

Science Focus: ESS1.B, ESS2.E, LS4.C, CCC4, CCC7, SEP1, SEP2

Rachel Zimmerman Brachman (@RachelZBrachman; *rachel.zimmerman-brachman@jpl.nasa.gov),* NASA Jet Propulsion Laboratory, Pasadena, Calif.

Discover how astrobiologists at NASA's Jet Propulsion Laboratory are searching for signs of life on icy moons of our solar system.

Online Mapping in Earth and Physical Science Classrooms

(Grades 7–College) *200E, Convention Center*

Science Focus: ESS, PS

Richard Smith *(rsmith@gsl.k12.mn.us),* Glencoe-Silver Lake High School, Glencoe, Minn.

John Olson (@JohnCasperOlson; *john.c.olson@state.mn.us),* Local Arrangements Coordinator, NSTA Minneapolis Area Conference; NSTA Director, Coordination and Supervison of Science Teaching; and Minnesota Dept. of Education, Roseville

Learn how to map student-collected and web-based data using free ArcGIS Online. You will see examples of student work and experience AGO firsthand.

Bioplastic—Going from Synthetic to Natural Polymers

(Grades 6–12) *200G, Convention Center*

Science Focus: ETS, LS, CCC, SEP

Sherri Rukes (@SherriRukes; *sherri.rukes@d128.org),* Libertyville High School, Libertyville, Ill.

Many of the items that we use today are becoming more Earth friendly. Learn how a bioplastic is made and what plant materials are used. Take home a CD with information and activities.

Incorporating STEM Across the Curriculum Through Inquiry

(Grades 4–College) *200H, Convention Center*

Science Focus: GEN

Michelle Carruthers *(michelle.carruthers@district196.org),* **Dan Dudley, Shaun Lindquist** (@valleymiddle; *shaun.lindquist@district196.org),* **Ryan Roseen** *(ryan.roseen@district196.org),* **Luke Podmers** (@lpodmers; *luke.podmers@district196.org),* **Sarah Pelinka** *(sarah.pelinka@district196.org),* **Brian Martin** (@bwmartin44; *bwmartin44@gmail.com),* and **Mary Spychalla** *(mary.spychalla@district196.org),* Valley Middle School of STEM, Apple Valley, Minn.

Come learn how to incorporate STEM across the curriculum by taking part in a few traditional lessons, and then shifting them to inquiry-based lessons.

The NSTA Learning Center: A Tool to Develop Preservice Teachers
(College) *201 A/B, Convention Center*
Science Focus: GEN
Flavio Mendez *(flavio_m@nsta.org),* Senior Director, NSTA Learning Center, NSTA, Arlington, Va.
Come learn about a new online system to assist professors in creating customized e-textbooks using the Learning Center's interactive and e-print resources for their preservice teachers.

Meaningful STEM
(Grades 7–College) *203 A/B, Convention Center*
Science Focus: ETS, SEP6, SEP7, SEP8
Matthew Nupen (@mattnupen; *matt.nupen@gmail.com),* 916 Mahtomedi Academy, White Bear Lake, Minn.
Find out how I hooked my students into STEM with a project theme that taught much more than science—inventing to change another person's life: an educator's dream.

Regenerative Medicine in the Classroom: Inquiry-Based Instruction
(Grades 9–College) *205D, Convention Center*
Science Focus: LS1.A, LS1.B, SEP3
Tami Limberg *(ptlimberg@hotmail.com),* Great River School, Saint Paul, Minn.
Nick Beermann *(nicholasbeermann@montessoriib.org),* MacDowell Montessori School, Milwaukee, Wis.
Use *planaria* to study mitosis, regenerative medicine, stem cells, and nature of science using inquiry-based methods. Take home a curriculum where students design their own investigations.

Monday Quotes to Friday Questions: How Strong Relationships Can Benefit Science Students
(Grades 7–12) *206 A/B, Convention Center*
Science Focus: GEN
Jennifer Aakre (@JenniferAakre; *jaakre@treknorth.org),* TrekNorth Junior and Senior High School, Bemidji, Minn.
Find out what solid connections with students might look like, ways to build them, and how they can impact a student's experience in science.

12:30–1:30 PM Hands-On Workshops

Promising Practices in STEM Education for English Language Learners
(Grades K–9) *Conrad A, Hilton*
Science Focus: GEN, INF, NGSS
Jerry Valadez *(jdvscience@yahoo.com),* NSTA Director, Multicultural/Equity in Science Education, and California State University, Fresno
Engage with successful STEM-rich making practices and learn how to support English language learners as equity-minded teachers and leaders.

Engineering: Blow the Roof Off!
(Grades 3–8) *Conrad B/C, Hilton*
Science Focus: ETS1, CCC, SEP
Karen Ostlund (@karenostlund; *klostlund@utexas.edu),* 2012–2013 NSTA President, and The University of Texas at Austin
Strong winds generated by hurricanes and tornados can lift the roof off a house. Use a model for the engineering design process that integrates the *NGSS* 3 Ds to design a better roof.

Forces, Motion, and Engineering for Kindergarten? Yes!
(Grade K) *Rochester, Hilton*
Science Focus: ETS1, PS2, CCC2, SEP
Eeva Burns *(eevaburns@gmail.com),* Big Hollow Middle School, Ingleside, Ill.
Through the use of simple materials, we will conduct activities to teach force, motion, vocabulary, and use the design engineering principles.

Planning and Designing Safe and Sustainable Facilities for STEM-Based Science (Science Facilities 101)
(General) *Symphony I/II, Hilton*
Science Focus: GEN
LaMoine Motz *(llmotz@comcast.net),* 1988–1989 NSTA President, and Motz Consultant Group, White Lake, Mich.
Juliana Texley *(texle1j@cmich.edu),* 2014–2015 NSTA President, and Central Michigan University, Mount Pleasant
Sandra West *(sw04@txstate.edu),* Texas State University, San Marcos
So you want new science facilities? Does your curriculum define your science teaching facility? With more than 15 years of conducting visits and presentations of new/renovated school science facilities, the author team of *NSTA Guide to Planning School Science Facilities* (2nd. ed.) will present the "basics" of science facility planning for safe, ergonomically designed, and sustainable facilities.

Building Bridges: Engineering in the Elementary Classroom

(Grades P–6) *200C, Convention Center*

Science Focus: ETS

Sara Nelson ((@SaraDNelson1; *sara.d.nelson@gmail.com),* Iowa State University, Ames

Patti Allen *(patti.allen@ames.k12.ia.us),* David Edwards Elementary School, Ames, Iowa

Jim Nelson *(james.s.nelson@gmail.com),* Iowa Dept. of Transportation, Ames

Learn about a unique collaboration that engaged students in STEM, literacy, and the arts. Participate in a portion of our lessons and experience firsthand the power of collaboration and building bridges together.

Seasons in the Sun

(Grades 6–8) *200D, Convention Center*

Science Focus: ESS1.B, CCC1, CCC3, SEP2, SEP4

Christine Shupla *(shupla@lpi.usra.edu),* Lunar and Planetary Institute, Houston, Tex.

Carol Waters *(cwaters@pasadenaisd.org),* Pasadena (Tex.) ISD

Wendell Colston *(wcolston@pasadenaisd.org),* Southmore Intermediate School, Pasadena, Tex.

Carrie Stokes *(clacystokes@comcast.net),* Harris County Dept. of Education, Houston, Tex.

Participate in data-rich activities, examining patterns in temperatures, modeling the reasons for seasons, and predicting patterns for the number of daylight hours for cities.

Using Online Datasets to Create Opportunities for Science Argumentation

(Grades 5–College) *200F, Convention Center*

Science Focus: GEN, SEP

Sharon Schleigh *(sharonpschleigh@gmail.com),* East Carolina University, Greenville, N.C.

In this hands-on activity, discover how to use datasets provided by online resources for classroom use to develop scientific arguments in support of students' claims.

Learning About What Was by Examining What Is, Part 1

(Grades 6–12) *200I, Convention Center*

Science Focus: ESS2.A, ESS2.C, CCC2, SEP

Mary Colson ((@MnMColson; *mcolson@moorheadschools.org),* Horizon Middle School, Moorhead, Minn.

Russell Colson *(colson@mnstate.edu),* Minnesota State University Moorhead

This science game mimics 20 Questions and requires students to make good field observations. Their observations serve as the basis for questions and claims about a mystery landscape feature. Students develop a tentative explanation for how past geologic processes formed the geologic feature and they support their claim/explanation with field evidence and reasoning. In Session 1, attendees play the role of student.

A High-Impact Exploration of Science and Engineering Concepts

(Grades 6–8) *200J, Convention Center*

Science Focus: ETS, SEP

Ken King *(kking@roosevelt.edu),* Roosevelt University, Chicago, Ill.

Join me for a surefire boost to your classroom instruction. Investigate science and engineering design concepts through the construction and testing of simple air-powered rockets.

NSTA Press® Session: *Basic Data Literacy: Helping Your Students (and You!) Make Sense of Data*

(Grades 5–College) *208 C/D, Convention Center*

Science Focus: GEN, SEP

G. Michael Bowen *(gmbowen@yahoo.com),* NSTA Director, District XVIII, and Mount Saint Vincent University, Halifax, N.S., Canada

Tony Bartley *(abartley@lakeheadu.ca),* Lakehead University, Thunder Bay, Ont., Canada

Doug Jones *(douglas_jones@lakeheadschools.ca),* Sir Winston Churchill Collegiate & Vocational Institute, Thunder Bay, Ont., Canada

Using examples from the NSTA Press book *Basic Data Literacy*, we will help teachers develop a framework for dealing with data that improve organization and analysis.

12:30–1:30 PM Exhibitor Workshops

Too Many Ideas: Helping Students Focus and Select a Topic to Investigate

(Grades 6–9) *101 I/J, Convention Center*

Science Focus: GEN, SEP1, SEP3

Sponsor: AEOP eCYBERMISSION

Matthew Hartman, eCYBERMISSION Content Manager, NSTA, Arlington, Va.

One way for science students to take ownership of their learning is to allow them a chance to choose what they want to investigate. But many students (especially in the middle grades) don't know where to start. This workshop will provide strategies for helping students focus and pick topics without becoming overwhelmed to the point of inaction. Discussion includes the online STEM competition eCYBERMISSION and how you and your students can participate at no cost.

What Is Amplify Science?

(Grades K–8) *101A, Convention Center*

Science Focus: GEN, NGSS

Sponsor: Amplify

Rebecca Abbott *(amplifyscience@berkeley.edu)* and **Traci Shields** *(amplifyscience@berkeley.edu),* The Lawrence Hall of Science, University of California, Berkeley

Explore Amplify Science, the newest breakthrough curriculum from University of California Berkeley's Lawrence Hall of Science for grades K–8. Discover how the immersive program, built from the ground up for *NGSS,* engages students as scientists and engineers to solve real-world problems.

CPO's Wind Turbine: A STEM Approach to Engineering and Design

(Grades 6–12) *101C, Convention Center*

Science Focus: ETS

Sponsor: CPO Science/School Specialty Science

Erik Benton, CPO Science/School Specialty Science, Nashua, N.H.

Kat Mills, School Specialty Science, Rosharon, Tex.

CPO's Link™ Wind Turbine learning module lets students learn in a real-time digital platform and engineer a wind turbine. Students build, test, and revise their designs. Link uses STEM activities and an *NGSS* approach, giving students an understanding of how to apply the engineering cycle in science class.

Scientific Practices: What Does Argumentation Look Like in an Elementary Classroom?

(Grades K–5) *101D, Convention Center*

Science Focus: GEN

Sponsor: Delta Education/School Specialty Science–FOSS

Diana Velez and **Brian Campbell,** The Lawrence Hall of Science, University of California, Berkeley

Join FOSS Next Generation Program developers to learn about science practices within the context of active investigations. Come experience analyzing and interpreting data, constructing explanations, and engaging in argumentation from evidence as tools to deepen student learning within a FOSS lesson. Find out about transitioning to FOSS Next Generation.

STEM-gineering

(Grades 2–6) *101E, Convention Center*

Science Focus: ETS

Sponsor: Delta Education/School Specialty Science

Kathy Armstrong, Northside Elementary School, Midway, Ky.

Darrick Wood, Distance Learning Coordinator, Louisville, Ky.

Join us for science lessons from Delta Science Modules that provide opportunities for students to be engaged in activities that incorporate Science, Technology, Engineering, and Math (STEM) and meet Technological Design Standards. Make-and-take prototypes, strategies, and other workshop materials will be shared.

Bring Visual Science into K–5 Classrooms—It's a Game Changer!

(Grades K–5) *101F, Convention Center*

Science Focus: GEN

Sponsor: Carolina Biological Supply Co.

Carolina Teaching Partner

Spark student interest and improve outcomes! Master teacher Harvey Bagshaw demonstrates engaging science instruction using Tigtag Science real-world STEM videos, interactive content, and a hands-on activity. Harvey's blend of compelling online learning tools with hands-on fun is guaranteed to delight you and your students! "Watch out! It might get messy."

Climate Proxies

(Grades 9–12) *101G, Convention Center*

Science Focus: ESS2.A, ESS2.C, ESS2.D

Sponsor: LAB-AIDS®, Inc.

Jennifer Boldt, Solon High School, Solon, Iowa

How can scientists tell what Earth's climate was like thousands of years before human measurements? This activity simulates the use of fossil ocean foraminifera, tiny organisms whose growth patterns are different in warm or cold water. We will analyze and graph samples of replicas of these organisms, and then determine relative warm and cold periods in the past 200,000 years. This activity is from *EDC Earth Science,* a new NSF-supported program from LAB-AIDS.

Outbreak! Zika Testing Using the Enzyme-Linked Immunosorbent Assay (ELISA)

(Grades 6–College) *101H, Convention Center*

Science Focus: LS

Sponsor: Edvotek Inc.

Maria Dayton, Edvotek Inc., Washington, D.C.

The spread of Zika virus has led to a public health crisis in the Americas. While most infections are mild, the virus can contribute to birth defects and neurological problems. We will perform a quick, easy ELISA that simulates Zika testing. Free gift/raffle entry for attending!

Use Science to Teach Reading; Reading to Teach Science

(Grades K–6) *102 A/B, Convention Center*

Science Focus: LS, CCC1, SEP7, SEP8

Sponsor: Learning A–Z

Lori Smith *(lori.smith@learninga-z.com),* Learning A–Z, Tucson, Ariz.

Come explore Learning A–Z's Science Literacy Collection, which allows teachers to deliver digital, leveled content and hands-on learning experiences that strengthen students' reading skills and scientific literacy simultaneously. This workshop features Investigation Packs, using high-interest, in-depth science content and close reading to solve a scientific mystery. Free trials for participants!

Constructing and Crossing Cell Membranes

(Grades 8–12) *102 E/F, Convention Center*

Science Focus: LS1, PS2, CCC, SEP

Sponsor: 3D Molecular Designs

Tim Herman *(herman@msoe.edu),* MSOE Center for Bio-Molecular Modeling, Milwaukee, Wis.

Hook biology and chemistry students with models that demonstrate the chemical and physical properties of water and the membranes that separate cells from the surrounding environment. Use hands-on teaching tools to explore diffusion, osmosis, and the transmembrane proteins that facilitate the transport of polar molecules across the cell membrane.

Bringing STEM to Light

(Grades 3–8) *102C, Convention Center*

Science Focus: PS4.B

Sponsor: LASER Classroom™

Colette DeHarpporte *(colette@laserclassroom.com),* LASER Classroom, Minneapolis, Minn.

Light is fascinating, familiar, and engaging—but can be a challenging topic to teach. Introduce the fundamentals of light and optics for grades 3–8. Hands-on activities make reflection, refraction, and color intuitive and concrete for early learners. This workshop is limited to 50 participants—all 50 will take home free kits.

2:00–2:30 PM Presentations

Using Cognate Words in a Bilingual Science Classroom
(Grades P–5) *Conrad A, Hilton*
Science Focus: GEN
Ivan Ochoa, James Hedges Elementary School, Chicago, Ill.
As a tool to understand and execute a second language, cognate words are necessary in today's bilingual science classrooms, particularly as content-specific vocabulary. Help your elementary bilingual students identify and use science content vocabulary stemming from cognate words, specifically those between English and Spanish languages.

P3: A Statewide Program/Policy Partnership to Advance PreK–12 STEM Education
(General) *200 A/B, Convention Center*
Science Focus: GEN, SEP
Jeff Weld *(jeff.weld@uni.edu),* Iowa Governor's STEM Advisory Council, Cedar Falls
Building a STEM culture across the state calls for systemic rather than piecemeal solutions—integrating classroom, community, and Capitol activities. A case study of Iowa STEM will be profiled.

The Impact of Mobile Technologies in a Preservice Classroom
(College) *206 A/B, Convention Center*
Science Focus: GEN
Meera Chandrasekhar (@meeraphysics; *meerac@missouri.edu)* and **Dorina Kosztin** *(kosztind@missouri.edu),* University of Missouri, Columbia
Deepika Menon *(dmenon@towson.edu),* Towson University, Towson, Md.
Review findings from a study investigating how affordances of mobile technology-based physics curriculum support preservice elementary teachers' confidence in using mobile technology in their teaching.

2:00–3:00 PM Featured Presentation

Inclusive STEM Schools: Deconstructing and Determining the Success of a Complex Innovation
(Grades 6–College) *205 A/B, Convention Center*
Science Focus: GEN

Melanie LaForce (@melanielaforce; *laforce@uchicago.edu),* Associate Director, Outlier Research & Evaluation, Chicago, Ill.

Presider: Claire Hypolite, STEMify Instruction Through Collaboration Across the Curriculum Strand Leader, and Edison High School, Minneapolis, Minn.

Recent policy studies examining the impact of inclusive STEM high schools have shown mixed results. In order to understand the potential impacts of attending an inclusive STEM school on student interest in and pursuit of STEM careers (or other desired outcomes), we must look deeper to describe and measure the implementation of STEM school strategies. This presentation will describe the complex task of identifying STEM school strategies and measuring their implementation and impact to ultimately understand when and why STEM schools may be successful.

Melanie LaForce *directs STEM school research at Outlier Research & Evaluation. She is currently the PI of the NSF-funded STEM Schools Study (S3), which examines the implementation of STEM school strategies and their relationship to student success. Prior to joining Outlier in 2011, Melanie served as a senior analyst at the Consortium for Chicago School Research in the Urban Education Institute (UEI) at The University of Chicago. Her core research mission is to better explicate how, why, and under what conditions educational practices may impact student motivation, self-perceptions, and ultimately success.*

2:00–3:00 PM Presentations

STEM Pathways: Informal Science Institutions and a School District United to Improve STEM Engagement and Learning

(Grades 1–8) *Conrad B/C, Hilton*

Science Focus: ETS, LS2, INF, CCC4, CCC7

Steven Walvig (@SteveWalvig; *walvig@thebakken.org)* and **Beth Murphy** *(bethmurphy@me.com),* The Bakken Museum, Minneapolis, Minn.

Elizabeth Stretch *(elizabeth.stretch@mpls.k12.mn.us),* Minneapolis (Minn.) Public Schools

Abby Moore *(abby.moore@state.mn.us),* Minnesota Zoo, Apple Valley

Shoghig Berberian *(berb0003@umn.edu),* Bell Museum of Natural History, Minneapolis, Minn.

Kit Wilhite *(kit@theworks.org),* The Works Museum, Minneapolis, Minn.

Santi Bromley *(sbromley@starbasemn.org),* STARBASE Minnesota, Saint Paul

Find out about an innovative school and an informal STEM education (ISE) partnership that implemented and evaluated a connected STEM pathway for students supporting standards-based learning and inspiring engagement.

Three New Lessons for Early Childhood STEM Educators: Engineering (as) an Answer to a Need

(Grades P–1) *Marquette III, Hilton*

Science Focus: ETS

Danielle Dornsife *(danielle.dornsife@ops.org),* Sunny Slope Elementary School, Omaha, Neb.

Hear about three early childhood engineering lessons based on beloved nursery rhymes.

Outdoor Learning

(Grades P–5) *Marquette IV, Hilton*

Science Focus: LS, CCC1, SEP8

Lisa Lyons *(lisa.lyons@district196.org)* and **Jill Jensen** (@GHSTEAMchic; *jill.jensen@district196.org),* Glacier Hills Elementary School of Arts and Science, Eagan, Minn.

Discover how to take primary students outside to enhance your curriculum on a weekly basis. Learn strategies and resources for nature exploration.

NMLSTA-Sponsored Session: Calling All Middle Level Teachers

(Grades 5–9) *Marquette V, Hilton*

Science Focus: GEN

Mary Lou Lipscomb *(mllscience@aol.com),* NMLSTA President, Naperville, Ill.

The National Middle Level Science Teachers Association is an organization devoted to middle level science education. Come learn about NMLSTA membership opportunities.

Authentic Research in the Classroom: Connecting NITARP with National and State Standards

(Grades 8–12) *Marquette VIII, Hilton*

Science Focus: ESS, SEP

Robert Palmer (@WSHstarskier; *rjpalmer@umn.edu),* University of Minnesota, Minneapolis

Lee Pruett *(lpruett@ndsj.org),* Notre Dame High School, San Jose, Calif.

Debbie French *(frenchd14@yahoo.com),* University of Wyoming, Laramie

Richard Sanchez *(rsanchez@jcsd1.us),* Clear Creek Middle School, Buffalo, Wyo.

The NASA IPAC Teacher Archive Research Program facilitates collaboration of teacher/student teams with NASA astronomers and peers around the country to perform authentic research.

NGSS@NSTA Forum Session: Selecting Phenomena to Motivate Student Sensemaking

(Grades K–12) *Minneapolis B/C, Hilton*

Science Focus: GEN. NGSS

Ted Willard *(twillard@nsta.org),* Program Director, NGSS@NSTA, NSTA, Arlington, Va.

The right phenomena are a key ingredient in successful three-dimensional teaching and learning. This session will focus on what makes some phenomena better than others and how to use them successfully in the classroom.

The AMS DataStreme Project: Digital Earth Science Education for Teachers

(General) *200C, Convention Center*

Science Focus: ESS, CCC, SEP

James Brey (@AMSeducation; *brey@ametsoc.org)* and **Wendy Abshire** (@AMSeducation; *wabshire@ametsoc.org),* American Meteorological Society, Washington, D.C.

Join the thousands who have instilled the excitement of real-world environmental information into their classroom with the help of the AMS DataStreme Project!

A Unique Ice Core Investigation That Integrates the Three Dimensions of the *NGSS*

(Grades 7–College) *200E, Convention Center*

Science Focus: ESS1, ESS2.A, ESS2.B, ESS2.D, ESS3.C, ETS2.B, PS1.A, PS1.B, PS2.A, PS2.C, PS3.B, PS3.D, PS4.B, CCC1, CCC2, CCC4, CCC5, CCC7, SEP

Donna Young *(dlyoung.nso@gmail.com),* Chandra X-Ray Center, Bullhead City, Ariz.

This open-ended investigation uses absolute and relative dating techniques and anomalies to date Icelandic and mid-latitude volcanoes, solar proton events, terrestrial events, and possibly supernovas.

Meet the Standards and Enhance Your Chemistry Classroom with Other People's Money

(Grades 9–12) *200G, Convention Center*

Science Focus: PS

Kenetia Thompson and **Karen Kaleuati** *(k_kaleuati@acs.org),* American Chemical Society, Washington, D.C.

Learn about grant opportunities available to high school chemistry teachers (including those from the American Chemical Society) and the process for writing a fundable proposal.

Do You Need a New Science Lab?

(Grades 6–12) *201 A/B, Convention Center*

Science Focus: GEN

Ruth Ruud *(ruudruth61@gmail.com),* Cleveland State University, Cleveland, Ohio

Win a Shell Science Lab Makeover ($20,000 value) for your school! Are you a middle school or high school science teacher in need of a science lab makeover? Attend this Shell Science Lab presentation and learn how you can apply to win the Shell Science Lab Challenge! You will have an opportunity to actually begin to complete the application and have your questions answered.

Meeting *NGSS* Practices Through Citizen Science and School Yard Investigations

(Grades K–12) *203 A/B, Convention Center*

Science Focus: LS, INF

Lindsay Glasner (@BirdSleuth; *lig27@cornell.edu),* The Cornell Lab of Ornithology, Ithaca, N.Y.

Meeting standards goes hand-in-hand with student research projects and contributing data to citizen science. Motivate students with school yard inquiry and real data. Leave with a copy of *BirdSleuth Investigator* .

Redefining STEM: A Cross-Curricular Approach

(Grades K–12) *205D, Convention Center*

Science Focus: GEN

Lee Schmitt *(lschmitt@hamline.edu),* Program Coordinator, NSTA Minneapolis Area Conference, and Hamline University, Saint Paul, Minn.

STEM is not a curriculum; it's a philosophy. We will look at redefining the acronym to help all teachers STEMify their instruction across all curricula through the use of common teaching strategies.

2:00–3:00 PM Hands-On Workshops

In This Picture I See: Using Images, Conversations, and Play as a Springboard to Learning Science Words and Concepts

(Grades 1–5) *Rochester, Hilton*

Science Focus: GEN

Joanne Billingsley (@JoanneBillings1; *jbillingsley@satx.rr.com),* Billingsley Education, San Antonio, Tex.

Young students enjoy pictures and word play. Join me for an outline of simple strategies for learning new science vocabulary based on imagery, gestures, and play.

Science Facilities 102: The Architects Have Started Without Me—What Do I Do Now?

(General) *Symphony I/II, Hilton*

Science Focus: GEN

LaMoine Motz *(llmotz@comcast.net),* 1988–1989 NSTA President, and Motz Consultant Group, White Lake, Mich.

Juliana Texley *(texle1j@cmich.edu),* 2014–2015 NSTA President, and Central Michigan University, Mount Pleasant

Sandra West *(sw04@txstate.edu),* Texas State University, San Marcos

Is your district planning for new science facilities? Are you involved? If not, you need to before it is too late. In an advanced course (an extension of Science Facilities 101 session) the NSTA author team for *NSTA Guide to Planning School Science Facilities* (2nd ed.) will present more detailed information and examples of safe, ergonomically correct, and functional science facilities for STEM-based science. Budgeting, working with the architect, technology, and special adjacencies will also be presented.

Climate Change and Forest Ecosystems: A Systems Approach

(Grades 9–12) *200D, Convention Center*

Science Focus: ESS3, SEP4, SEP7

Laura Duffey *(laura.duffey@state.mn.us),* Minnesota Dept. of Natural Resources, Saint Paul

Explore patterns and relationships between climate change and terrestrial ecosystems using recent, scientific, and U.S.-based forest data. Walk away with multiple classroom-ready lessons.

STEM Chem: Bringing Engineering into the Chemistry Classroom

(Grades 9–12) *200H, Convention Center*

Science Focus: PS, SEP3, SEP4, SEP6, SEP8

Mauree Haage (@MAHaage; *mauree.haage@gmail.com),* Twin Cedars Community School District, Bussey, Iowa

Experience ways of incorporating engineering activities into your chemistry classroom and how this applies to *NGSS* and STEM.

Learning About What Was by Examining What Is, Part 2

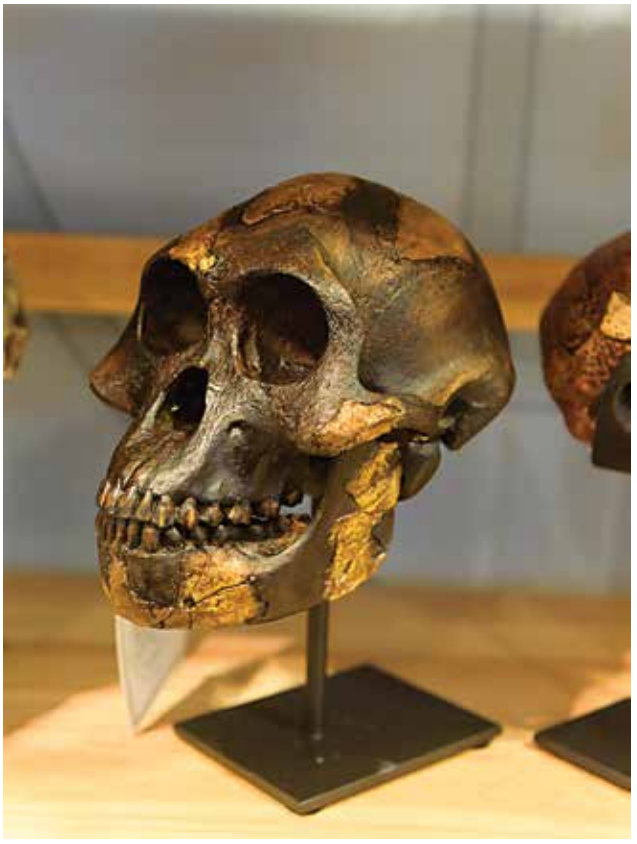
(Grades 6–12) *200I, Convention Center*

Science Focus: GEN, CCC2

Mary Colson *(mcolson@moorheadschools.org),* Horizon Middle School, Moorhead, Minn.

Russell Colson (@MnMColson; *colson@mnstate.edu),* Minnesota State University Moorhead

During this session (Part 2), we will reflect on the experience of playing the science game Learning About What Was by Examining What Is (Part 1) and look for evidence of three-dimensional learning. Participants will be introduced to a few key aspects of the EQuIP rubric for the *NGSS*.



2:00–3:00 PM Exhibitor Workshops

Flinn Scientific's Exploring Chemistry™: Connecting Content Through Experiments

(Grades 9–12) *101 I/J, Convention Center*

Science Focus: PS

Sponsor: Flinn Scientific, Inc.

Jillian Saddler, Flinn Scientific, Inc., Batavia, Ill.

Join us as we present interactive activities and demonstrations that showcase the features and benefits of our Exploring Chemistry line of kits! We will highlight integrated lab and learning activities for some of the major topics in your chemistry curriculum. These experiments, demonstrations, and POGIL™ activities ensure that students really understand the concepts and get a glimpse of the underlying simplicity and beauty of chemistry!

Smart Management of Water Resources Using TI Graphing Calculators and the TI-Innovator Hub

(Grades 6–12) *101A, Convention Center*

Science Focus: GEN, NGSS

Sponsor: Texas Instruments

Fred Fotsch, Texas Instruments, Dallas

In this hands-on workshop, learn how to enable your students to apply programming skills and knowledge of the water cycle and photosynthesis to solve a real-world problem. Your students will be able to design a smart water management system by programming a TI graphing calculator to control a TI-Innovator Hub with attached motors and temperature, moisture, and humidity sensors.

Building Electric Circuits with CPO's New Link™ Learning Module

(Grades 6–12) *101C, Convention Center*

Science Focus: ETS

Sponsor: CPO Science/School Specialty Science

Erik Benton, CPO Science/School Specialty Science, Nashua, N.H.

Kat Mills, School Specialty Science, Rosharon, Tex.

The new CPO's Link Electric Motor learning module is a STEM- and *NGSS*-based approach to electromagnets, permanent magnets, commutators, and induction in a real-time tablet-based learning environment using hands-on equipment. The engineering cycle, observation, measurement, and experimentation are used to design and build electric motors with student-based activities.

What Does Conceptual Modeling Look Like in an Elementary Classroom?

(Grades K–5) *101D, Convention Center*

Science Focus: PS

Sponsor: Delta Education/School Specialty Science–FOSS

Brian Campbell, The Lawrence Hall of Science, University of California, Berkeley

Join FOSS Next Generation Program developers to explore how students construct models within the context of physical science. Experience strategies within an active investigation to create and refine models about matter. Find out how student models can be used to guide future instruction within the FOSS program.

Increase Your 3-D Vision of *NGSS*

(Grades 3–5) *101E, Convention Center*

Science Focus: GEN, NGSS

Sponsor: Delta Education/School Specialty Science

Darrick Wood, Distance Learning Coordinator, Louisville, Ky.

Kathy Armstrong, Northside Elementary School, Midway, Ky.

Experience lessons from Delta Science Modules that incorporate the three dimensions of the *NGSS.* Tackle argumentation embedded in the session. Receive corresponding content reader, strategies, and resources that you can take back and use with your students next week.

Keep Calm and Chemistry On: Successful Lab Activities for the New Chemistry Teacher

(Grades 9–12) *101F, Convention Center*

Science Focus: PS

Sponsor: Carolina Biological Supply Co.

Carolina Teaching Partner

Looking for lab activities that work every time, not just periodically? Explore easy, engaging, and safe chemistry activities that are sure to produce a reaction from your students. Whether you're new to chemistry or feeling out of your element, you'll learn ways to create excitement with hands-on labs and demonstrations.

Chemical Batteries
(Grades 6–8) *101G, Convention Center*
Science Focus: PS, CCC2, CCC5, SEP1, SEP2, SEP3, SEP4
Sponsor: LAB-AIDS®, Inc.
Judy Stier, Silverbrook Intermediate School, West Bend, Wis.
Although we live a battery-powered lifestyle, most of us (students included) have no idea how batteries actually work. In this hands-on workshop, we will engage in an activity from *Issues and Physical Science* from LAB-AIDS. Make a wet cell battery, explore the effect of using different metal electrodes on battery output, and consider ways to reduce the number of discarded batteries in the waste stream.

Using Biotechnology to Diagnose HIV/AIDS
(Grades 9–College) *101H, Convention Center*
Science Focus: LS
Sponsor: Edvotek Inc.
Brian Ell and **Maria Dayton,** Edvotek Inc., Washington, D.C.
The Human Immunodeficiency Virus (HIV) causes acquired immune deficiency syndrome (AIDS), a serious disease that suppresses a patient's immune system, leaving them susceptible to infections. In this simulation, we'll perform two common tests (western blot, ELISA) used by doctors to diagnose an HIV infection. Receive a free gift!

STEM Literacy: Strategies for Making Complex Text Meaningful
(Grades K–12) *102 A/B, Convention Center*
Science Focus: GEN, NGSS
Sponsor: Accelerate Learning–STEMscopes
Sharry Whitney *(swhitney@acceleratelearning.com),* Accelerate Learning–STEMscopes, Houston, Tex.
Join us as we learn the power of using close reading strategies to engage students in reading, writing, and discussing the science text in collaborative groups, which can lead to student mastery and high achievement. Build the capacity for scientific literacy success in your STEM classroom!

The Many Jobs of Proteins: Enzymes in the Spotlight
(Grades 8–College) *102 E/F, Convention Center*
Science Focus: LS1, PS, CCC1, CCC2, CCC4, CCC6, CCC7, SEP1, SEP2, SEP6
Sponsor: 3D Molecular Designs
Tim Herman *(herman@msoe.edu),* MSOE Center for Bio-Molecular Modeling, Milwaukee, Wis.
Use 3-D physical representations to discover that proteins are linear sequences of amino acids that spontaneously fold into complex shapes following basic principles of chemistry. This hands-on workshop explores a specific class of proteins—enzymes—to introduce the concepts of substrate, active site, specificity, and competitive/noncompetitive inhibition.

Discourse Tools for Equitable and Rigorous Talk
(Grades 5–8) *102C, Convention Center*
Science Focus: GEN, SEP8
Sponsor: Activate Learning
Heather Milo, Activate Learning, Greenwich, Conn.
The *Framework* promotes learning as a fundamentally social endeavor supported by collaborative and communicative norms. Yet, sustaining these norms requires all members to articulate, make sense of, and evaluate each other's ideas, making discourse tools vitally important. Walk away with ready-to-use tools that foster productive talk around big science ideas!

2:30–3:00 PM Presentation

Nano@Illinois Research Experiences for Teachers (RET)

(Grades 6–College) *200 A/B, Convention Center*

Science Focus: GEN, INF

Carrie Kouadio *(ckouadio@illinois.edu),* **Irfan Ahmad, Lynford Goddard,** and **Xiuling Li,** University of Illinois at Urbana-Champaign, Urbana

Hear about NSF-funded nano@illinois RET participants' summer research experiences in nanoscale science and engineering at the University of Illinois. Discussion includes module development and professional development. Visit *www.nano.illinois.edu* for more information.

3:30–4:00 PM Presentation

Educational Collaboration with the Chemical Heritage Foundation

(Grades 10–11) *200F, Convention Center*

Science Focus: PS, CCC1, CCC2, CCC4, CCC5, CCC6, CCC7, SEP

Paul Orbe, Academy for Enrichment and Advancement, Union City, N.J.

Experience an example of a STEM activity developed by the Chemical Heritage Foundation involving plastics. Join me for an overview and some interesting results.

3:30–4:30 PM Presentations

Strategies for Equity in the High School Classroom

(Grades 8–12) *Conrad A, Hilton*

Science Focus: GEN

Kate Rosok and **Randy Hedlund** *(randy.hedlund@mpls.k12.mn.us),* South High School, Minneapolis, Minn.

Join us as we share our experiences in multilingual, multiracial, and multicultural classrooms, and learn how we've changed our teaching.

Differentiating K–6 Science Instruction to Enable All Students to Inquire, Explore, Participate, and Achieve Success

(Grades K–6) *Marquette IV, Hilton*

Science Focus: GEN, NGSS

Donna Knoell (@DonnaKnoell; *dknoell@sbcglobal.net),* Educational Consultant, Overland Park, Kans.

Join in for ways to differentiate effectively to maximize student participation and learning, as well as to accommodate the needs of English language learners and the diverse range of student abilities in K–6 science classrooms.

Sing for the Planet

(Grades 3–8) *Marquette V, Hilton*

Science Focus: GEN, INF

Juliana Texley *(texle1j@cmich.edu),* 2014–2015 NSTA President, and Central Michigan University, Mount Pleasant

Integrate the Grammy award–winning work of Pete Seeger and the Rivertown Kids, as well as eight other award-winning free films with support materials. Sing, dance, and celebrate!

If They Make It, They Will Learn: The Maker Movement and K–12 STEM

(Grades K–12) *200 A/B, Convention Center*

Science Focus: GEN

Jack Samuelson *(jacksamuelson@icloud.com),* Dr. STEM Express, Milwaukee, Wis.

"Making" is more than tinkering, and the Maker Movement offers powerful, project-based lessons for learning STEM in K–12 classrooms.

Climate Literacy → Climate Solutions

(Grades 5–12) *200E, Convention Center*

Science Focus: ESS3, CCC

June Teisan *(june.teisan@noaa.gov),* NOAA Office of Education, Washington, D.C.

Want to teach climate literacy but don't know where to start? The National Oceanic and Atmospheric Administration (NOAA) offers a spectrum of online lesson plans, videos, data sets, webinars, and more to inform and inspire students to engineer solutions to climate concerns.

U.S. Department of Energy's BioenergizeME Infographic Challenge: Creative Methods to Explore Energy Literacy

(Grades 9–12) *201 A/B, Convention Center*

Science Focus: ESS2, ESS3, ETS, LS, PS1, PS3, CCC5, CCC6, CCC7, SEP

Alexis Wolfe (@BioenergizeME; *alexis.wolfe@ee.doe.gov),* **Sheila Dillard** *(sheila.dillard@ee.doe.gov),* and **Shannon Zaret** *(shannon.zaret@ee.doe.gov),* U.S. Dept. of Energy, Washington, D.C.

The U.S. Department of Energy's BioenergizeME Infographic Challenge is designed to support high school educators and administrators in planning classroom activities that integrate bioenergy topics with cross-curricular STEM topics.

Leveraging Technology to Teach a Hands-On/Minds-On *NGSS* Curriculum in a Digital Environment

(Grades 4–12) *205D, Convention Center*

Science Focus: GEN, CCC1, CCC4, SEP2, SEP4, SEP7, SEP8

Mark Yanisch (@Mark_Yanisch; *mark.yanisch@wfbschools.com),* Whitefish Bay Middle School, Milwaukee, Wis.

Engage students in collaborative science practices adapting an *NGSS*-focused curriculum using Google and other technology for collaborative science practices, seamless assessment, and teacher efficiency.

Building Student Collaboration Through the Use of Agile Methodology and Project-Based Learning

(Grades 6–12) *206 A/B, Convention Center*

Science Focus: GEN, SEP1, SEP3

Brian Martin (@bwmartin44; *bwmartin44@gmail.com),* Valley Middle School of STEM, Saint Paul, Minn.

Paul Olson (@polson196; *paul.olson@district196.org),* Rosemount-Apple Valley-Eagan Public Schools, Rosemount, Minn.

We will outline ways to use the agile method of computer programming in classrooms to promote collaboration, inquiry, interdependence, and Project-Based Learning.

3:30–4:30 PM Hands-On Workshops

Developing and Implementing *NGSS*-Focused Curricula in Gillette, Wyoming: Strategies and Tools for Elementary Science and Literacy Integration

(Grades K–6) *Marquette III, Hilton*

Science Focus: GEN, CCC1, CCC2, CCC4, SEP7, SEP8

Ana Houseal *(ahouseal@uwyo.edu),* University of Wyoming, Laramie

Jodi Crago-Wyllie *(jcrago@ccsd.k12.wy.us),* Campbell County School District, Gillette, Wyo.

Explore newly developed *NGSS*-focused units in grades 3, 4, and 5 with an emphasis on strategies embedded within the lessons and activities that explicitly link ELA with science.

NGSS@NSTA Forum Session: Transitioning Instructional Materials for the *NGSS*

(Grades K–12) *Minneapolis B/C, Hilton*

Science Focus: GEN, NGSS

Iram Shaikh *(ishaikh@achieve.org),* Achieve, Inc., Washington, D.C.

Explore tools and resources that can help evaluate whether instructional materials are designed for the *NGSS* and help guide their revision if they aren't.

CESI-Sponsored Session: Elementary Science Share-a-Thon

(Grades P–8) *Minneapolis E–G, Hilton*

Science Focus: GEN, INF, SEP

Jim McDonald (@jimscienceguy; *jim.mcdonald@cmich.edu),* CESI President, and Central Michigan University, Mount Pleasant

Karen Ostlund (@karenostlund; *klostlund@utexas.edu),* 2012–2013 NSTA President, and The University of Texas at Austin

Betty Crocker *(betty.crocker@unt.edu),* Retired Educator, Denton, Tex.

Join CESI members as they share a variety of elementary science ideas that can be integrated with other subjects. Walk away with handouts to implement in your classroom.

Potpourri of Chemistry Engagement Strategies

(Grades 9–12) *200G, Convention Center*

Science Focus: PS

ChrisAnn Johnson *(christine.johnson@isd742.org)* and **Heather Johnson** *(heather.johnson@isd742.org),* Apollo High School, Saint Cloud, Minn.

Engage in an enthalpy mini-lab, a vocabulary strategy, a naming compounds introductory activity, as well as formative assessment strategies.

Video Analysis and Spreadsheets with Air Cannons
(Grades 9–12) *200H, Convention Center*
Science Focus: PS2.A, CCC1, SEP2, SEP4
Paul Anderson (@sciencepaul; *panderso@bhmschools.org),* Buffalo-Hanover-Montrose School District, Buffalo, Minn.
Nerf darts can be launched with simple air cannons made from PVC pipes and data can be collected with videos. By using software like Logger *Pro*® or Tracker, students can analyze the motion and program a spreadsheet to predict the motion of the dart.

Biological Machines: Bioengineering Activities for the Classroom
(Grades 3–College) *200J, Convention Center*
Science Focus: LS, INF
Carrie Kouadio *(ckouadio@illinois.edu),* **Ritu Raman** (@raman_ritu; *rraman9@illinois.edu),* and **Ghazal Naseri Kouzehgarani** *(naserik1@illinois.edu),* University of Illinois at Urbana-Champaign, Urbana
Lizanne DeStefano *(ldestefano6@gatech.edu),* CEISMC, Georgia Institute of Technology, Atlanta
Cutting-edge research on biological machines for use in health, security, and environment will inspire interest. Hands-on activities and ethics modules will engage your students.

NSTA Press® Session: Inside or Out: The Perfect Place for Connecting Outdoor Science and Children's Trade Books
(Grades K–6) *208 C/D, Convention Center*
Science Focus: GEN
Christine Anne Royce (@caroyce; *caroyce@aol.com),* Shippensburg University, Shippensburg, Pa.
Steve Rich (@bflyguy; *bflywriter@comcast.net),* University of West Georgia, Carrollton
Engage in lessons that connect investigations in outdoor science topics with paired children's literature to enhance the topic and integrate other discipline areas.

3:30–4:30 PM Exhibitor Workshops

CPO Science's Link™ Module: Learning About Chemistry Models
(Grades 6–12) *101C, Convention Center*
Science Focus: PS
Sponsor: CPO Science/School Specialty Science
Erik Benton, CPO Science/School Specialty Science, Nashua, N.H.
Kat Mills, School Specialty Science, Rosharon, Tex.
CPO's new Link Chemistry Models module is an *NGSS* approach that lets students experience innovative activities to learn about atomic structure and the periodic table. We'll use a digital learning environment with hands-on equipment to study bonding, isotopes, subatomic particles, ions, balancing equations, energy levels, and periodicity.

Evolutionary Evidence in the Fossil Record: Life Science with FOSS
(Grades 6–8) *101D, Convention Center*
Science Focus: LS
Sponsor: Delta Education/School Specialty Science–FOSS
Virginia Reid and **Jessica Penchos,** The Lawrence Hall of Science, University of California, Berkeley
What does the fossil record tell us about how life has changed over time? Explore evolutionary history through hands-on activities from the new FOSS Next Generation Edition Heredity and Adaptation Course for Middle School, and identify connections to the three dimensions of *NGSS.*

Liven Up Literacy with Science
(Grades K–5) *101E, Convention Center*
Science Focus: GEN, NGSS
Sponsor: Delta Education/School Specialty Science
Kathy Armstrong, Northside Elementary School, Midway, Ky.
Darrick Wood, Distance Learning Coordinator, Louisville, Ky.
Use science to put some enthusiasm into your literacy program. Come experience engaging lessons from Delta Science Modules that incorporate literacy skills. Receive corresponding content reader, strategies, and resources that you can take back and use with your students next week.

Hands-On Science with Classroom Critters
(Grades K–12) *101F, Convention Center*
Science Focus: LS
Sponsor: Carolina Biological Supply Co.
Carolina Teaching Partner
Add action and excitement to your science class with live organisms! Discover fun hands-on activities with pill/sow bugs, termites, bessbugs, and butterflies you can use in your labs. Learn about care and handling, as well as easy ways to introduce inquiry. Additional resources available online.

Reclaiming the Metal
Grades 6–8) *101G, Convention Center*
Science Focus: PS1.B, CCC5, SEP3, SEP7
Sponsor: LAB-AIDS®, Inc.
Judy Stier, Silverbrook Intermediate School, West Bend, Wis.
In this activity from the SEPUP middle level physical science program, participants role-play a scenario involving the pretreatment of copper containing liquid wastes from a computer circuit board manufacturer. They examine trade-offs of metal replacement and chemical precipitation, techniques actually used in industrial applications, and in so doing, come to understand the science behind complex environmental issues.

Environmental Toxicology Using Edvotek's New EZ-elegans
(Grades 9–College) *101H, Convention Center*
Science Focus: LS
Sponsor: Edvotek Inc.
Maria Dayton and **Brian Ell,** Edvotek Inc., Washington, D.C.
Model organisms allow scientists to investigate biological questions that cannot be studied in humans. Learn how Edvotek's EZ-elegans simplifies culturing *C. elegans* in your classroom. Then, explore effects of environmental factors on *C.elegans* using a simple locomotion assay. Integrate STEM concepts with data collection and statistics. Freebie/raffle entry for attending!

Let's Pick Our Brains
(Grades P–8) *102 A/B, Convention Center*
Science Focus: LS
Sponsor: Nasco
Lainna Callentine, *Sciexperience.com,* Plainfield, Ill.
Roll up your sleeves and explore ways to experience science using hands-on activities that draw from many multiple intelligence styles. We will demonstrate using one of the most integral organs—the brain. Learn practical tips to make hands-on dissection come alive for your students regardless of the level. Enhance your projects with resources that students can create at home. Come let us pick our brains and peer into the ultimate multitaskers.

Modeling Earth, the Sun, and Other Stars with Bring Science Alive!
(Grades K–5) *102C, Convention Center*
Science Focus: ESS
Sponsor: TCI
Brian Thomas *(info@teachtci.com),* TCI, Cincinnati, Ohio
Experience learning from a student's perspective as you find out about the relationship between Earth, the Sun, and other stars using a powerful online learning system. The lesson was entirely built on the *NGSS.*

Exploring Video-Based Projects
(Grades 3–8) *102D, Convention Center*
Science Focus: GEN, SEP3, SEP4, SEP8
Sponsor: Houghton Mifflin Harcourt
Todd Koenig, Houghton Mifflin Harcourt, Oak Park, Minn.
Imagine taking your students anywhere in the world, yet keeping them engaged right in your classroom! Turn your kids into true student scientists as they investigate problems, interpret data, engineer solutions, and have fun! Free digital access.

4:00–4:30 PM Presentation

Technology, Data, and Chemistry

(Grades 10–11) *200F, Convention Center*

Science Focus: PS, CCC1, CCC2, CCC3, CCC4, CCC6, CCC7, SEP

Paul Orbe, Academy for Enrichment and Advancement, Union City, N.J.

Come learn how to understand ocean acidification using technology and real data. Join me for an overview of the learning activity and some interesting results.

4:30–6:00 PM Networking Opportunity

MnSTA Social

Duluth, Hilton

Come join the Minnesota Science Teachers Association to meet and network with elementary and secondary teachers across the state.

—*photo courtesy of Jacob Slaton*

5:00–5:30 PM Presentations

Creating a Classroom Alphabet Book

(Grades 1–12) *201 A/B, Convention Center*

Science Focus: GEN

Daniel Larson *(djwerl@aol.com),* Retired Teacher, Plymouth, Minn.

Join me as I share experiences from two teachers from different ends of the classroom spectrum in crreating alphabet books. This project involves research, writing, art, creativity, and cooperation.

Empowering Our Students to Be Citizen Scientists

(Grades 1–10) *206 A/B, Convention Center*

Science Focus: ESS3, LS2, INF, CCC1, CCC2, CCC4, SEP1, SEP4

Susan Koppendrayer (@teachspacemn; *skdrayer@calvinchristian.org),* Calvin Christian School, Edina, Minn.

Hear how citizen science provides students with an established outlet for real scientific practice, web-based research, and global application that meets the *NGSS*.

5:00–6:00 PM Presentations

Student Investigations: Get Good Questions!

(Grades 4–8) *Marquette V, Hilton*

Science Focus: LS, SEP1

Katie-Lyn Bunney and **Sarah Weaver** *(weave048@umn.edu),* University of Minnesota Monarch Lab, Saint Paul

Gillian Roehrig, STEM Education Center, St. Paul, Minn.

Transform student wonderings into authentic research questions.

NASA's Eyes on the Solar System: Bringing the Planets to Your Classroom's Computers

(Grades 5–12) *200 A/B, Convention Center*

Science Focus: ESS1.B, CCC4, SEP2

Rachel Zimmerman Brachman (@RachelZBrachman; *rachel.zimmerman-brachman@jpl.nasa.gov)* and **Kevin Hussey** (@NASA_Eyes; *kjhussey@jpl.nasa.gov),* NASA Jet Propulsion Laboratory, Pasadena, Calif.

Bring the solar system to your classroom using this free online tool from NASA. Explore planets, spacecraft, and more!

Bringing Climate Change to Life Through COP21: Teachers at the Paris Climate Talks
(General) *200E, Convention Center*
Science Focus: ESS3
Kristen Poppleton (@ClimateGenOrg; *kristen@climategen.org),* Climate Generation: A Will Steger Legacy, Minneapolis, Minn.
Beckie Alexander *(beckie.alexander@breckschool.org),* Breck School, Golden Valley, Minn.
Lauren Lindelof-Leith *(lauren@avalonschool.org),* Avalon School, Saint Paul, Minn.
Climate Generation brought 10 teachers to COP21 in December 2015, to act as learners and to communicate climate change back to their educational settings and communities.

Chemistry Concepts STEAM-ified
(Grades 5–12) *200G, Convention Center*
Science Focus: PS
Julie Smith *(julieltapresident@gmail.com),* Lennox Middle School, Lennox, Calif.
Discover how a paper chemistry set, online animations, and other resources are used to teach *NGSS* chemistry disciplinary core ideas, including modeling atomic structure, periodic table organization, and chemical bonding.

Science Outside: No Box Needed
(Grades 5–10) *203 A/B, Convention Center*
Science Focus: INF
Christina Porn, Science Consultant, Erie, Colo.
Learning does not need to happen only in a classroom. Spark interest for science outside the classroom through providing unique experiences. Get the most out of your field trips through focusing on the pre- and post-trip experience.

5:00–6:00 PM Hands-On Workshops

Inquiry Matters: Identify Unknown Liquids
(Grades 4–8) *Conrad B/C, Hilton*
Science Focus: PS1.A, CCC6, SEP3, SEP4, SEP6
Patricia Galvan *(p_galvan@acs.org),* American Chemical Society, Washington, D.C.
Conduct simple tests on four clear, colorless household liquids to identify unknowns. Videos explain observations. Complete instructions will be provided and are available at *www.inquiryinaction.org.*

Whoosh, Crack, Slide, and Crash Your Way into a Grade 5 Earth Science Unit
(Grades 4–6) *Marquette III, Hilton*
Science Focus: ESS2.A, ESS2.B, ESS2.C, CCC7, SEP2, SEP3, SEP4, SEP6, SEP7, SEP8
Nicole Hosek *(nicole.hosek@district196.org)* and **Gretchen Lansing** *(gretchen.lansing@district196.org),* Glacier Hills Elementary School of Arts and Science, Eagan, Minn.
Explore tsunamis, hurricanes, earthquakes, landslides, and floods through hands-on investigations and connections to literacy.

Picture Pages: Using Images and Student-Centered Conversations to Enhance Science Vocabulary, Build Literacy Skills, and Assess Student Thinking
(Grades 1–8) *Rochester, Hilton*
Science Focus: GEN
Joanne Billingsley *(jbillingsley@satx.rr.com),* Billingsley Education, San Antonio, Tex.
Discover a powerful strategy for using images, conversations, and word play to develop science vocabulary, improve capacity for deep reading, and produce authentic writing opportunities.

Inventing Is Just Plain Fun (for All)!
(Grades 4–12) *200C, Convention Center*
Science Focus: ETS, SEP6
Anthony Perry (@tonyperry; *aperry@mit.edu),* The Lemelson-MIT Program, Cambridge, Mass.
Mark Westlake (@STAEVT; *mwestlake@cadets.com),* Saint Thomas Academy, Saint Paul, Minn.
Gain experience leading a design challenge and incorporating invention to provide engaging cross-curricular opportunities using a variety of community resources.

Strategies to Enhance Science Instruction Through Standards-Based Assessments
(Grades 5–8) *200F, Convention Center*
Science Focus: GEN, CCC, SEP
Jennifer Richards *(jennifer.richards@utk.edu),* The University of Tennessee Institute of Agriculture, Knoxville
Meaningful assessment that supports inquiry-based science instruction is challenging. Explore creative ways to integrate standards-based assessments to enhance instructional quality and student learning. Take home an interdisciplinary curriculum, Hands-On: Real-World Lessons for Middle School Classrooms, integrating experiential learning in core subject areas with food science through the study of microbiology.

Implementing Physics First in Missouri
(Grades 9–12) *200H, Convention Center*
Science Focus: PS2, SEP
Meera Chandrasekhar (@meeraphysics; *meerac@missouri.edu),* University of Missouri, Columbia
I'll describe the implementation of a yearlong high school freshman physics course in 53 Missouri districts. Discussion includes the methods, benefits, and pitfalls.

Zombies Don't Stand a Chance Against STEM!
(Grades 6–College) *200I, Convention Center*
Science Focus: LS
Jeffrey Lukens *(jeffreylukens0613@gmail.com),* Sioux Falls (S.Dak.) School District
Use the "Zombie Craze" to make STEM become "un-dead" in your science classroom! This is not only a hands-on session, but a brains-on session, as well!

Exploring the Science and Engineering Practices
(Grades K–12) *208 C/D, Convention Center*
Science Focus: GEN, SEP
Ted Willard *(twillard@nsta.org),* Program Director, NGSS@NSTA, NSTA, Arlington, Va.
Come explore science and engineering practices (such as constructing explanations and developing models) that are central to the vision of education described in the *Framework* and the *NGSS*.

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Exhibit Hall C

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NSTA National Science Teachers Association

—photo courtesy of the Science Museum of Minnesota

Climb up the stairs to the bridge inside the Charles E. *towboat on the roof of the Science Museum of Minnesota and get a panoramic view of the Mississippi. See page 12 for a special offer to conference attendees to visit the Science Museum of Minnesota.*

8:00–9:00 AM Presentations

"Bee" Wild About Pollinators
(Grades K–2) *Marquette III, Hilton*
Science Focus: LS
Jennifer Kil *(jkil249@yahoo.com),* Palmer Lake Elementary School, Brooklyn Park, Minn.
Michele Hollingsworth Koomen *(mkoomen@gac.edu),* Gustavus Adolphus College, Saint Peter, Minn.
Bonnie Johnson *(bjjpez@gmail.com),* Retired Educator, Minneapolis, Minn.
We will share our five-day unit that includes lessons on bee anatomy, bee communities, bee pollination, observing bees, and a short research study.

Looking Inside Argument-Based Inquiry Classrooms
(Grades 1–8) *Symphony IV, Hilton*
Science Focus: GEN, SEP
Brian Hand *(brian-hand@uiowa.edu),* The University of Iowa, Iowa City
Discover innovative approaches for having science classrooms meet *NGSS* practices by looking at a video of teachers using the Science Writing Heuristic approach.

Jackson Middle School: A Specialty School for Math and Science: Developing Confident, Critical Thinkers Through Inquiry and Integrated Learning Experiences
(Grades 6–8) *200 A/B, Convention Center*
Science Focus: GEN, CCC, SEP
Jane Matheson *(jane.matheson@anoka.k12.mn.us),* **Mandy Freese, Christina Gilbertson** *(christy.gilbertson@anoka.k12.mn.us),* and **Ron Schmit** *(ronald.schmit@anoka.k12.mn.us),* Jackson Middle School–A Specialty School for Math and Science, Champlin, Minn.
Hear how Jackson Middle School became a specialty school for math and science. We will cover our STEM integration, electives, inquiry-infused lessons, and amazing observatory.

The Monarch Butterfly: Sophisticated Science
(Grades 4–9) *200C, Convention Center*
Science Focus: LS2, INF, SEP4
Sarah Weaver *(weave048@umn.edu) and* **Katie-Lyn Bunney,** University of Minnesota Monarch Lab, Saint Paul
Gillian Roehrig (@ghroehrig; *roehr013@umn.edu),* STEM Education Center, St. Paul, Minn.
Engage students with citizen science data to understand current monarch research and inspire authentic investigations. Go beyond the life cycle with data sets!

Solids: The Neglected "State" of Chemistry
(Grades 9–12) *200E, Convention Center*
Science Focus: PS1.A, CCC6
Debbie Goodwin *(nywin@hotmail.com),* Retired High School Science Teacher, Chillicothe, Mo.
Use solids to make chemistry more relevant for students. Hands-on STEM activities using solid materials (metals/polymers/ceramics) make concepts easier to teach/learn. I'll share *NGSS* correlations and participants will receive a CD of information.

AAPT Session: 30 Demos in 60 Minutes: High School
(Grades 9–12) *200F, Convention Center*
Science Focus: ESS, LS, PS, SEP3
Wendy Adams *(wendy.adams@unco.edu),* University of Northern Colorado, Greeley
Join me for 30 dynamic demonstrations that will engage students in the wonder of science. I'll share tips on the setup, materials, procedure, and underlying science concepts.

The NGSS@NSTA Hub
(Grades K–12) *201 A/B, Convention Center*
Science Focus: GEN, NGSS
Ted Willard (@Ted_NSTA; *twillard@nsta.org),* Program Director, NGSS@NSTA, NSTA, Arlington, Va.
This session will feature a tour of the NGSS@NSTA Hub, a digital destination to support teaching and learning of the *Next Generation Science Standards.* Hear about the work of NGSS@NSTA curators—a group of educators from all across the U.S. working to identify resources that support the standards.

Global Anatomy and Physiology Students Display Interest in Curated Online Help
(College) *203 A/B, Convention Center*
Science Focus: LS, SEP8
Margaret Reece *(mreece@centralny.twcbc.com),* Reece Biomedical Consulting LLC, Manlius, N.Y.
Hear how to evaluate the level of interest of anatomy and physiology college students globally in a blog that curates online resources.

School District and Community Engagement in STEM Education on the International Space Station…and Beyond

(General) *205 A/B, Convention Center*

Science Focus: ESS, CCC, SEP

Jeff Goldstein (@doctorjeff; *jeffgoldstein@ncesse.org),* Arthur C. Clarke Institute for Space Education, Ellicott City, Md.

What happens when a community gets their own space program, engaging hundreds of students in experiment design, with one launching to Space Station…or if given a model solar system?

Students Reading Real Science: Primary Literature in the Classroom

(Grades 9–College) *205C, Convention Center*

Science Focus: GEN, SEP1, SEP2, SEP3, SEP4, SEP6, SEP7, SEP8

Melissa McCartney (@SciClassroom; *mmccartn@aaas.org), Science*/AAAS, Washington, D.C.

View a demonstration of a web-based resource designed to make primary scientific articles (from the journal *Science)* accessible to students and teachers.

Preparing for the Minnesota Science Standards Review in 2018

(General) *205D, Convention Center*

Science Focus: GEN

Doug Paulson (@DPaulsonSTEM; *doug.paulson@state.mn.us),* Minnesota Dept. of Education, Roseville

John Olson (@JohnCasperOlson; *john.c.olson@state.mn.us),* Local Arrangements Coordinator, NSTA Minneapolis Area Conference; NSTA Director, Coordination and Supervison of Science Teaching; and Minnesota Dept. of Education, Roseville

We will provide input for reviewing the Minnesota Science Standards in 2018. Learn the process and how to get involved. Explore the research that will influence it.

8:00–9:00 AM Hands-On Workshops

Designing Lessons for the Private School Setting That Implement the *NGSS* Using the Engineering Design Process

(Grades 1–8) *Marquette I/II, Hilton*

Science Focus: ETS1

Susan Koppendrayer (@teachspacemn; *skdrayer@calvinchristian.org),* Calvin Christian School, Edina, Minn.

Unsure how to integrate the *NGSS* at your private school? Join this hands-on workshop to see how to integrate the standards with your school's mission.

Interdisciplinary Approach to Code in the Classroom: Not One More Thing!

(Grades K–8) *Marquette IX, Hilton*

Science Focus: GEN, SEP5

Angie Kalthoff (@MrsKalthoff; *kalthoff@pd.code.org),* St. Cloud (Minn.) Area School District 742

Diana Fenton *(dfenton@csbsju.edu),* College of Saint Benedict/Saint John's University, Saint Joseph, Minn.

We will walk you through interdisciplinary lessons using code in your elementary and middle level classrooms. See how adding computer science is not one more thing and how you might be already incorporating these concepts.

NESTA Shares: Innovative Ways to Teach About Weather Observation and Weather Hazards

(Grades 5–12) *Minneapolis E–G, Hilton*

Science Focus: ESS

Michael Passow *(michael@earth2class.org),* Dwight Morrow High School, Englewood, N.J.

NESTA members will share a variety of strategies to enhance your studies of weather and weather hazards to help implement *NGSS* and network your school.

Magnificent Magnets

(Grades P–1) *Rochester, Hilton*

Science Focus: PS2

Terrie Schmoldt *(schmoldtt@evansville.k12.wi.us),* Levi Leonard Elementary School, Evansville, Wis.

Explore with magnets and discover ways to integrate hands-on science with reading and journaling. Optimize your teaching with shared reading, guided exploration, and individualized journaling.

ARTsome Astronomy
(Grades 1–12) *200D, Convention Center*
Science Focus: ESS, CCC1, CCC3, SEP4
Marie Steckelberg (@msteckelberg; *marie@steckelbergconsulting.com),* Steckelberg Consulting, LLC, Yankton, S.Dak.
DeVee Dietz *(devee.dietz@k12.sd.us),* Sturgis Williams Middle School, Sturgis, S.Ddak.
Rocket through the solar system through the lens of an artist! Fuse science, technology, and art to understand the geologic story of our celestial neighbors.

ASEE Session: LED Projects for Teaching Electrical Concepts
(Grades 4–College) *200I, Convention Center*
Science Focus: ETS1, ETS2.B, PS3.B, PS3.D, CCC5, CCC6, SEP1, SEP5, SEP6
Andrew Tubesing, University of St. Thomas, Saint Paul, Minn.
Use LEDs to explore electricity, substitute for expensive equipment, and facilitate design projects that combine STEAM with real-world issues. Participants will build an LED torch.

Classroom iPad iDeas
(Grades 7–College) *200J, Convention Center*
Science Focus: GEN, NGSS
Gregory Dodd *(gbdodd@gmail.com),* Retired Educator, Charleston, W.Va.
Experience the enormous potential of the iPad and how to make the iPad an essential tool in your science classroom.

NSTA Press® Session: Using Real-World Data to Promote Three-Dimensional Instruction
(Grades 6–College) *208 C/D, Convention Center*
Science Focus: GEN, NGSS
Donna Governor *(dgovernor@windstream.net),* University of North Georgia, Dahlonega
G. Michael Bowen *(gmbowen@yahoo.com),* NSTA Director, District XVIII, and Mount Saint Vincent University, Halifax, N.S., Canada
Engage students in the crosscutting concepts and practices of science and engineering by having them create and conduct investigations using real-world data.

8:00–9:00 AM Exhibitor Workshops

Fantastic Physical Science Demonstrations from Flinn Scientific
(Grades 7–12) *101 I/J, Convention Center*
Science Focus: PS
Sponsor: Flinn Scientific, Inc.
Gus Alvarez, Flinn Scientific, Inc., Batavia, Ill.
Amaze your students with quick demonstrations that teach common physical science topics, including density, motion, force and equilibrium, rotation, waves, light and color, energy, pressure, and scientific inquiry. More than a dozen effective demonstrations will be performed. Handouts provided for all activities.

Implementing Science Seminars and Scientific Argumentation with Amplify Science
(Grades 6–8) *101A, Convention Center*
Science Focus: GEN, SEP7
Sponsor: Amplify
Rebecca Abbott *(amplifyscience@berkeley.edu)* and **Traci Shields** *(amplifyscience@berkeley.edu),* The Lawrence Hall of Science, University of California, Berkeley
What is a science seminar? How do I effectively implement scientific argumentation in the classroom? Discover how the Amplify Science approach supports students as they gain expertise formulating written and oral arguments. Experience an authentic and powerful instructional sequence that supports students in formulating both oral and written arguments.

Contagion! Track the Progress of Dangerous Viruses That Are Spreading Throughout the Country
(Grades 9–College) *101B, Convention Center*
Science Focus: LS
Sponsor: Bio-Rad Laboratories
Leigh Brown, Bio-Rad Laboratories, Hercules, Calif.
Disease can spread like wildfire through populations. In this hands-on workshop you will assume the role of an epidemiologist and use an ELISA assay to track viruses like HIV, Ebola, Zika, and SARS. See if you can find patient zero.

Modeling Climate Change Impacts: Dissolving Carbon Dioxide

(Grades 9–12) *101C, Convention Center*

Science Focus: ESS2, ESS3, LS2, PS

Sponsor: PASCO scientific

Michael Blasberg *(blasberg@pasco.com),* PASCO scientific, Roseville, Calif.

Rising temperatures are not the only impact of increased CO_2 emissions. Earth's oceans have acted as a buffer by dissolving excess CO_2 into solution. In this quick hands-on activity, create a model to investigate the effects of dissolved CO_2 using the wireless pH sensor and experience how easy inquiry can be.

STEM and *NGSS* Inquiry in Chemistry—Effective, Efficient, Economical

(Grades 9–12) *101D, Convention Center*

Science Focus: PS

Sponsor: Pearson

Ed Waterman, Retired Educator, Fort Collins, Colo.

Learn how to transition to a STEM and *NGSS* student-centered chemistry classroom by implementing safe, simple, material-conserving, time-efficient, and effective inquiry activities in chemistry. Safety and differentiation are built in. Teach core content while fostering problem solving, creativity, and invention. Students design original experiments not possible with traditional methods.

Exploring a Genetic Trait with Stickleback Fish

(Grades 9–12) *101E, Convention Center*

Science Focus: LS3

Sponsor: HHMI BioInteractive

Sherry Annee, Brebeuf Jesuit Preparatory School, Indianapolis, Ind.

Develop a rich and relevant lesson about genetic inheritance by using a short film, lab activity, and virtual lab. Emphasis will be placed on collecting and analyzing data to determine the type of inheritance. Participants are encouraged to bring a laptop, although it is not mandatory.

Shark Dissection: A "Jaw"some Experience!

(Grades 9–12) *101F, Convention Center*

Science Focus: LS

Sponsor: Carolina Biological Supply Co.

Carolina Teaching Partner

Dive in and learn how to create your own Shark Week! This workshop guides participants through a hands-on dissection of the dogfish shark. Take a bite out of the *NGSS* related to adaptations and structure and function while giving your students an experience they'll never forget.

Waves

(Grades 6–8) *101G, Convention Center*

Science Focus: PS4.A, PS4.B, CCC2, CCC5, SEP3, SEP4, SEP7, SEP8

Sponsor: LAB-AIDS®, Inc.

Lisa Kelp, LAB-AIDS, Inc., Ronkonkoma, N.Y.

Waves transmit energy and information—and although we depend on them utterly for communication in this information age—most students have no idea about the basics. Join us for an activity from the SEPUP Waves unit for middle grades, newly updated for *NGSS*. We will explore the interaction of light and matter through reflection and refraction and learn how the frequency of visible light is related to the energy it contains. Free print and equipment samples.

Integrating Chromebook with Vernier Data-Collection Technology

(Grades 3–12) *101H, Convention Center*

Science Focus: GEN, SEP3, SEP4

Sponsor: Vernier Software & Technology

David Carter *(info@vernier.com),* Vernier Software & Technology, Beaverton, Ore.

Collecting and analyzing data help students learn critical science concepts that increase test scores and promote science inquiry. In this hands-on workshop, learn how Vernier supports teachers who use Chromebook devices in their classrooms. Experiments such as "Boyle's Law," "Grip Strength Comparison," and "Ball Toss" will be conducted.

Building the Skills of Argumentation and Collaboration in STEM

(Grades K–12) *102 A/B, Convention Center*

Science Focus: GEN, SEP7

Sponsor: Accelerate Learning–STEMscopes

Sharry Whitney *(swhitney@acceleratelearning.com),* Accelerate Learning–STEMscopes, Houston, Tex.

"Engaging in argument from evidence" is a practice of scientists and engineers that is a vital part of a STEM classroom. Join us in this interactive workshop where we will model protocols and structures that you can use for successful implementation of consensus building and evidence-based argumentation in your classroom.

Let's Get Helical: Exploring DNA Structure and Function with Physical Models

(Grades 9–College) *102 E/F, Convention Center*

Science Focus: LS1, LS3, CCC

Sponsor: 3D Molecular Designs

Tim Herman *(herman@msoe.edu),* MSOE Center for Bio-Molecular Modeling, Milwaukee, Wis.

DNA can be viewed as a macromolecule or a source of genetic information. Explore both features with interactive DNA models and a paper bioinformatics exercise focusing on the beta subunit of hemoglobin. Examine the mutation that leads to sickle cell disease and the regulation of fetal and adult hemoglobin expression.

Analyzing and Interpreting Data Using TCI's Bring Science Alive!

(Grades K–5) *102C, Convention Center*

Science Focus: GEN, NGSS

Sponsor: TCI

Brian Thomas *(info@teachtci.com),* TCI, Cincinnati, Ohio

Get your students to do more than just read a graph, chart, or statement. Participants will be immersed in a Bring Science Alive! classroom where students analyze and interpret data and construct an argument based on research.

Exploring Video-Based Projects

(Grades 3–8) *102D, Convention Center*

Science Focus: GEN, SEP3, SEP4, SEP8

Sponsor: Houghton Mifflin Harcourt

Todd Koenig, Houghton Mifflin Harcourt, Oak Park, Minn.

Imagine taking your students anywhere in the world, yet keeping them engaged right in your classroom! Turn your kids into true student scientists as they investigate problems, interpret data, engineer solutions, and have fun! Free digital access.

8:00–10:00 AM Hands-On Workshop

ACS Session One: Energy in Chemistry—A Macroscopic View

(Grades 9–12) *200H, Convention Center*

Science Focus: PS3, SEP6

Marta Gmurczyk *(m_gmurczyk@acs.org),* American Chemical Society, Washington, D.C.

Jennifer Keil *(jenniferkeil11@gmail.com),* Thornton High School, Thornton, Colo.

Chad Bridle *(cbridle1@gpsbulldogs.org),* Grandville High School, Grandville, Mich.

Rebecca Stober, Mapleton Expeditionary School of the Arts, Denver, Colo.

Engage in design activities that can help students meaningfully understand energy transfer between systems with different temperatures by designing devices with specific properties and testing their properties. These activities have been developed to deepen students' conceptual understanding about energy, heat, and temperature in macroscopic systems.

8:00 AM–5:00 PM Meeting

Discover the *NGSS* Train-the-Trainer Workshop

(By Preregistration Only) *Conrad A, Hilton*

This workshop gives teacher leaders a solid understanding of the *NGSS,* tools for conducting teacher training, and the ongoing support they need to be leaders.

9:00 AM–3:00 PM Exhibits

Hall C, Convention Center

Did you know that NSTA offers Exclusive Exhibits Hall hours today from 1:30 to 3:00 PM? During these hours there are no teacher sessions scheduled and it's a perfect time to visit the exhibits and discover all the products and services companies and organizations have to offer. Some exhibitors will offer materials for sale throughout the conference.

9:30–10:00 AM Presentation

ASTE-Sponsored Session: Milkweed Adaptation Distributed Research Project

(Grades 7–College) *Marquette IV, Hilton*

Science Focus: LS2, LS4, SEP

Emily Mohl *(mohl@stolaf.edu),* St. Olaf College, Northfield, Minn.

Participating schools will collaboratively test the hypothesis that common milkweed plants are locally adapted, which has implications for monarch butterfly conservation.

9:30–10:30 AM Presentations

Instructional Strategies for Equity in the Science Classroom to Close the Achievement Gap

(Grades 1–12) *Conrad B/C, Hilton*

Science Focus: GEN, NGSS

Renae Lenhardt *(renae.lenhardt@anoka.k12.mn.us),* Anoka-Hennepin School District, Anoka, Minn.

Discuss common beliefs concerning race and ethnicity. Learn to improve your classroom teaching by addressing these beliefs with strategies to close the achievement gap.

Supporting Writing in the Elementary Science Classroom

(Grades K–5) *Marquette V, Hilton*

Science Focus: GEN, SEP7, SEP8

Julie Tangeman *(julie.tangeman@mpls.k12.mn.us)* and **Jennifer Rose** *(jennifer.rose@mpls.k12.mn.us),* Minneapolis (Minn.) Public Schools

Learn to support student understanding of science concepts and practices by scaffolding and modeling multiple types of expository writing that teach science standards and *CCSS*.

NSELA-Sponsored Session: Tools for Science Leaders, Part 1

(General) *Marquette VIII, Hilton*

Science Focus: GEN

Keri Randolph (@nselascience; *randolph.keri@gmail.com),* NSELA President, and Hamilton County Dept. of Education, Chattanooga, Tenn.

Come learn about the various tools and strategies science leaders can use to enhance teaching and learning in their outreach.

Embedded Assessment: Making Instructional Activity Opportunities for Formative Assessment

(Grades K–8) *Symphony IV, Hilton*

Science Focus: GEN, NGSS

Eric Greenwald *(eric.greenwald@berkeley.edu),* The Lawrence Hall of Science, University of California, Berkeley

Explore techniques and work through examples of how to build formative assessment opportunities into students' learning experiences, without stopping the flow of instruction.

Citizen Science: Projects and Activities to Engage Students in Authentic Science Research

(Grades 4–8) *200 A/B, Convention Center*

Science Focus: LS, INF, SEP

Kelly Schaeffer (@BirdSleuth; *kms448@cornell.edu),* The Cornell Lab of Ornithology, Ithaca, N.Y.

Sarah Carter *(scarter@tpt.org),* Twin Cities Public Television, St. Paul, Minn.

Barbara Jacobs-Smith *(barbara.jacobs-smith@breckschool.org),* Breck School, Golden Valley, Minn.

Explore citizen science projects that can engage your students in authentic science data collection and investigation as they contribute to big data sets.

Using Pop Culture and Polymers to Create Inquisitive Minds

(Grades 4–12) *200E, Convention Center*

Science Focus: PS1, PS2, CCC, SEP

Sherri Rukes (@polychemgirl; @sherrirukes; *sherri.rukes@d128.org),* Libertyville High School, Libertyville, Ill.

Ever wonder how to get more students interested in what you teach? Add some pop culture and a pop culture project to make the connection with the students. CD provided.

AAPT Session: 30 Demos in 60 Minutes for Elementary and Middle School

(Grades P–8) *200F, Convention Center*

Science Focus: PS

Wendy Adams, University of Northern Colorado, Greeley

Join me for 30 dynamic demonstrations that will engage students in the wonder of science. I'll share tips on the setup, materials, procedure, and underlying physics concepts.

How to Implement STEM and *NGSS* into Your Classroom Through the Use of NSTA Competitions

(Grades K–12) *201 A/B, Convention Center*

Science Focus: GEN, NGSS

Sue Whitsett *(swhitsett@nsta.org),* AEOP Project Director NSTA, Arlington, Va.

Hear about various NSTA competitions and how they can bring STEM and the *NGSS* into the classroom, as well as give students and teachers a chance to earn recognition and prizes.

Using Bioinformatics to Teach About the Hidden Message in DNA and Computational Computer Science Skills

(Grades 9–12) *203 A/B, Convention Center*

Science Focus: ETS1.A, LS4.A, SEP1, SEP4, SEP5, SEP7, SEP8

Walter Glogowski *(wglogowski@gmail.com), 123STEM.com,* Northfield, Ill.

Learn how to use algorithmic thinking to engage students in understanding the hidden messages in DNA code for such things as the replication origin in DNA, the asymmetry of DNA replication, and why DNA plays a role in molecular clocks. No programming experience is necessary to attend. Participants who want to use computer programming may wish to download and install the free IPython Notebook on their laptops prior to the presentation.

Eureka! Science Trade Books: Good as Gold!

(General) *205C, Convention Center*

Science Focus: GEN, SEP8

Suzanne Flynn, Lesley University and Cambridge College, Carver, Mass.

Juliana Texley *(texle1j@cmich.edu),* 2014–2015 NSTA President, and Central Michigan University, Mount Pleasant

Need great books for student learning? Explore and use NSTA Recommends and the Children's Book Council Outstanding Science Trade Books. Door prizes—books, of course!

Connect and Collect #Twitter

(General) *205D, Convention Center*

Science Focus: GEN, INF, SEP

Laurie Callies (@ljcallies), Eden Prairie (Minn.) Schools

Learn to leverage Twitter to connect students, promote discussions, discover resources, communicate with experts, collect data to expand sample sizes, and enrich research opportunities for the practice of science.

Strengthen Your STEM Lessons with NSTA High School Committee Activities

(Grades 8–12) *206 A/B, Convention Center*

Science Focus: GEN, SEP

Brenda Walsh (*brenda_walsh@edenpr.org),* NSTA Director, District IX, and Eden Prairie High School, Eden Prairie, Minn.

A variety of lessons and activities will be presented to enrich your current curricula, connecting with the *NGSS* science and engineering practices. Resources available online.

9:30–10:30 AM Hands-On Workshops

Electricity Made Simple

(Grades 4–9) *Marquette I/II, Hilton*

Science Focus: ETS, PS, CCC2, CCC4, SEP1, SEP3, SEP4

Lawrence Scheckel *(lscheckel@charter.net),* Retired Educator, Tomah, Wis.

Plug in new learning in your classroom with hands-on activities for those who know very little about basic electricity. Leave with ideas on how to teach simple electrical circuits. Lots of handouts.

Connecting the Skills of Literacy and Science Through Children's Literature and STEM Topics

(Grades 3–7) *Marquette III, Hilton*

Science Focus: ESS, ETS, SEP2, SEP8

Christine Anne Royce (@caroyce; *caroyce@aol.com),* Shippensburg University, Shippensburg, Pa.

Let's investigate a series of activities that help to integrate science and literacy skills with a STEM focus through the use of children's literature.

CESI-Sponsored Session: Integrating Science for Young Children with an Outdoor Focus

(Grades P–3) *Marquette IX, Hilton*

Science Focus: GEN, INF, SEP

Jim McDonald (@jimscienceguy; *jim.mcdonald@cmich.edu),* CESI President, and Central Michigan University, Mount Pleasant

I'll present engaging activities that allow you to take children outside and easily integrate science, art, music, and social studies while using *NGSS* science practices.

NESTA Shares: Innovative Ways to Teach About Minerals, Rocks, and Resources
(Grades 5–12) *Minneapolis E–G, Hilton*
Science Focus: ESS
Michael Passow *(michael@earth2class.org),* Dwight Morrow High School, Englewood, N.J.
NESTA members share examples of grade-appropriate classroom-ready activities to address *NGSS* concepts about minerals, rocks, and natural resources.

Engineering FOR, FROM, and BY Animals: A Powerful Way to Engage Students and Teachers in STEM Learning at the Zoo and in the Classroom
(Grades 3–8) *Rochester, Hilton*
Science Focus: ETS, LS, INF, CCC6, SEP1, SEP2, SEP7, SEP8
Kristi Berg *(kristi.berg@state.mn.us)* and **Abby Moore** *(abby.moore@state.mn.us),* Minnesota Zoo, Apple Valley
Find out how the Minnesota Zoo engages teachers and students in STEM using the zoo as an exciting context for learning.

STEMify Your Teaching Using Best Practices of STEM Education in Your Classroom
(Grades K–8) *200C, Convention Center*
Science Focus: GEN, NGSS
Thomas Meagher (@meagher3dan; *tmeagher@owatonna.k12.mn.us),* Owatonna (Minn.) Public Schools
Practice specific strategies that can move lessons from any content area toward a STEM approach. Bring your creativity and lesson ideas to find out how integrating your curriculum can engage all students in STEM learning.

Real-World Connections Through Space Systems Science
(Grades 5–12) *200D, Convention Center*
Science Focus: ESS, ETS, CCC4, SEP1, SEP4, SEP8
Barry Fried *(bfriedfab4@optonline.net),* Independent Consultant, East Meadow, N.Y.
Honora Dash *(hdash@schools.nyc.gov),* Edward R. Murrow High School, Brooklyn, N.Y.
Experience how to use professional learning networks to support an enriched, real, rigorous, and all-inclusive classroom learning environment using Earth and space sciences as a unifying theme by incorporating problem- and project-based activities using transdisciplinary models, enhancing literacy skills through authentic science learning experiences, and making real-world connections.

ACS Middle Level Session: Solids, Liquids, Gases, and Changes of State
(Grades 6–8) *200G, Convention Center*
Science Focus: PS1.A
James Kessler and **Patricia Galvan** *(p_galvan@acs.org),* American Chemical Society, Washington, D.C.
Explore solids, liquids, gases, and changes of state through hands-on activities and molecular animations from the free completely developed 5E lesson plans available at *www.middleschoolchemistry.com*.

ASEE Session: Fluid Power Builds Creative Careers
(Grades 6–9) *200I, Convention Center*
Science Focus: ETS
Lynn Beyer (@TheNFPA; *lbeyer@nfpa.com),* National Fluid Power Association, Milwaukee, Wis.
Get middle school students interested in fluid power careers by providing a hands-on problem-solving activity for them—the NFPA Fluid Power Challenge.

NEXT Generation Robotics (Made Simple)
(Grades 4–12) *200J, Convention Center*
Science Focus: ETS, SEP
Brad Blue *(bradbblue@gmail.com),* Design & InnoVation Lab, Minneapolis, Minn.
The plethora of hardware and software tools, the ease of coding, and the savvy of robotics creates a big sandbox and makerspace to play. From LEGO® to Raspberry Pi, we will play together.

NSTA Press® Session: *Argument-Driven Inquiry in Physical and Life Science: Lab Investigations for Grades 6–8*
(Grades 6–8) *208 C/D, Convention Center*
Science Focus: LS, PS1.A, CCC, SEP
Victor Sampson (@drvictorsampson; *victor.sampson@gmail.com)* and **Ashley Hamill Murphy** (@AshleyHMurphy; The University of Texas at Austin
Learn about Argument-Driven Inquiry and how it can help students learn how to use core ideas, crosscutting concepts, and science practices to explain natural phenomena.

9:30–10:30 AM Exhibitor Workshops

Cool! Can We Do That Again?!
(Grades 3–10) *101 I/J, Convention Center*
Science Focus: PS1.A, PS1.B, PS4.A
Sponsor: Educational Innovations, Inc.
Jeffrey Feidler, Consultant, Wilmington, Del.
Tired of hearing "Do we have to do that!?" from your students? Come check out some of the coolest activities involving polymers, color, and light. Your students will be asking if they can do that again—and again! Door prizes, freebies, and fun!

Not Your Typical Classroom Experience: Amplify Science's Digital Engineering Internships
(Grades 6–8) *101A, Convention Center*
Science Focus: ETS
Sponsor: Amplify
Rebecca Abbott *(amplifyscience@berkeley.edu)* and **Traci Shields** *(amplifyscience@berkeley.edu),* The Lawrence Hall of Science, University of California, Berkeley
Discover Amplify Science's digital Engineering Internships—compelling, immersive classroom experiences. As students become interns at the firm Futura Engineering, teachers are able to facilitate an authentic opportunity for students to iterate and design solutions to real-world problems.

Investigate Photosynthesis and Cellular Respiration with Algae Beads
(Grades 8–College) *101B, Convention Center*
Science Focus: LS
Sponsor: Bio-Rad Laboratories
Leigh Brown, Bio-Rad Laboratories, Hercules, Calif.
Use algae beads in a colorimetric assay to study both photosynthesis and cellular respiration in authentic inquiry investigations (AP Biology Big Idea 2: Labs 5 and 6). Learn how to extend this lab to study the effects of light intensity, light color, temperature, and other organisms on these processes.

Exploring Misconceptions: Speed and Velocity
(Grades 9–12) *101C, Convention Center*
Science Focus: PS2.A
Sponsor: PASCO scientific
Michael Blasberg *(blasberg@pasco.com),* PASCO scientific, Roseville, Calif.
Speed and velocity are two ways to describe the motion of an object that students often confuse. In this workshop, you will use the wireless Smart Cart to collect real-time motion data and compare the graphs of the Smart Cart's speed and velocity.

Teaching Geoscience in an *NGSS*-Focused Curriculum
(Grades 9–College) *101D, Convention Center*
Science Focus: ESS
Sponsor: Pearson
Michael Wysession, Washington University in St. Louis, Mo.
A member of the *NGSS* writing team, Michael Wysession will talk about challenges and solutions to teaching Earth and space science (ESS) that meets the *NGSS*.

Connect Your Classroom with HHMI BioInteractive's Lizard Evolution Virtual Lab
(Grades 9–12) *101E, Convention Center*
Science Focus: LS
Sponsor: HHMI BioInteractive
Timothy Guilfoyle, Phillip O. Berry Academy of Technology, Charlotte, N.C.
Engage your students while encouraging opportunities to use technology to collect and analyze their own data through exercises modeled after actual research studies on Caribbean anoles. Participants will be introduced to free classroom-ready resources from HHMI BioInteractive to integrate strategies suitable for all levels of high school biology.

The Best of Engineering for Elementary Students
(Grades 1–5) *101F, Convention Center*
Science Focus: ETS
Sponsor: Carolina Biological Supply Co.
Carolina Teaching Partner
What is engineering for elementary students? How do I know it when I see it? Participants will define engineering and experience the practices of engineering and science through lessons from the new Smithsonian Engineering and Science program developed from the ground up to meet the *NGSS*.

pH Scale and Math Modeling
(Grades 9–12) *101G, Convention Center*
Science Focus: PS1.B, CCC3, SEP3, SEP4, SEP5
Sponsor: LAB-AIDS®, Inc.
Brandon Watters, Vernon Hills High School, Vernon Hills, Ill.
What does pH actually measure? In this investigation, you will measure pH indirectly using indicators and absorption using the Lab-Master. Using their data, participants generate a graph of absorbance vs. pH. This graph can be used to determine the pH of solutions, within the measured pH range. Join us for this activity from *The Natural Approach to Chemistry* program.

Chemistry with Vernier

(Grades 9–12) *101H, Convention Center*

Science Focus: PS, SEP3, SEP4

Sponsor: Vernier Software & Technology

David Carter *(info@vernier.com),* Vernier Software & Technology, Beaverton, Ore.

In this hands-on workshop, learn how Vernier supports chemistry teachers who want their students to use probeware. A variety of experiments from our popular chemistry lab books will be conducted. Learn how our innovative data-collection technology works across multiple platforms such as LabQuest 2, computer, Chromebook, and iPad.

Let's Pick Our Brains

(Grades P–8) *102 A/B, Convention Center*

Science Focus: LS

Sponsor: Nasco

Lainna Callentine, *Sciexperience.com,* Plainfield, Ill.

Roll up your sleeves and explore ways to experience science using hands-on activities that draw from many multiple intelligence styles. We will demonstrate using one of the most integral organs—the brain. Learn practical tips to make hands-on dissection come alive for your students regardless of the level. Enhance your projects with resources that students can create at home. Come let us pick our brains and peer into the ultimate multitaskers.

3D Printing for the BioScience Classroom

(Grades 9–College) *102 E/F, Convention Center*

Science Focus: LS1, PS2, CCC, SEP

Sponsor: MSOE Center for BioMolecular Modeling

Tim Herman *(herman@msoe.edu),* MSOE Center for BioMolecular Modeling, Milwaukee, Wis.

Recent advances in 3D printing technology make these amazing machines affordable for schools. Learn how 3D printing can be used to integrate *NGSS* science and engineering practices with crosscutting concepts and disciplinary core ideas through creating physical models of molecular structures in your biology or chemistry classroom!

Hands-On Approach to Teaching Anatomy and Physiology!

(Grades 5–College) *102C, Convention Center*

Science Focus: LS

Sponsor: ANATOMY IN CLAY® Learning System

JP Theriault, Zahourek Systems, Inc., Loveland, Colo.

Susan McDonald, Western Iowa Tech Community College, Sioux City

Explore a hands-on technique for building human anatomy in clay on handheld skeletal models. This interactive experience promotes innovation, values different learning styles, and prepares all students for success in health careers. Join in to build muscles and body systems in clay, a perfect fit to integrate *NGSS* and STEM practices into your classroom.

miniPCR PTC Taster Lab—From Genotype to Phenotype

(Grades 6–College) *102D, Convention Center*

Science Focus: LS1, LS3, LS4, CCC2, CCC3, SEP1, SEP2, SEP3, SEP4, SEP6, SEP7, SEP8

Sponsor: miniPCR

Ezequiel Alvarez Saavedra *(team@minipcr.com)* and **Sebastian Kraves** *(team@minipcr.com),* miniPCR, Cambridge, Mass.

Are you a super taster? Come explore the molecular genetics of taste at the DNA level! Learn how a single letter change in our DNA can transform our taste perception. In this classroom-friendly lab, students start from a cheek swab and use PCR, restriction enzymes, and electrophoresis to study their taste receptor genes.

10:30 AM–12:30 PM Hands-On Workshop

ACS Session Two: Energy in Chemistry—A Particulate View

(Grades 9–12) *200H, Convention Center*

Science Focus: PS3, SEP2, SEP6

Marta Gmurczyk *(m_gmurczyk@acs.org),* American Chemical Society, Washington, D.C.

Jennifer Keil *(jenniferkeil11@gmail.com),* Thornton High School, Thornton, Colo.

Chad Bridle (@sciencebridle; *cbridle1@gpsbulldogs.org),* Grandville High School, Grandville, Mich.

Rebecca Stober, Mapleton Expeditionary School of the Arts, Denver, Colo.

Engage in modeling activities focused on energy transfer during physical and chemical processes by building and analyzing particulate models of matter. These activities are designed to deepen students' conceptual understanding of how kinetic and potential energy of particles change during phase changes and in chemical reactions, and how this information can be used to analyze changes in our surroundings.

11:00–11:30 AM Presentations

ASTE-Sponsored Session: Using Corn as a Model Organism to Foster Students' Agricultural Literacy and Understanding of Plant Genetics

(Grade 3) *Marquette IV, Hilton*

Science Focus: LS, SEP2

Devarati Bhattacharya (@devaratib2014; *devarati@unl.edu),* **Cory Forbes** (corytforbes; *cforbes3@unl.edu), and* **Erin Ingram** *(eingram3@unl.edu),* University of Nebraska–Lincoln

Researchers will facilitate an interactive session about an eight-week grade 3 plant genetics unit that uses corn as a model organism for understanding growth and inheritance.

Laser Cutters + 3D Printers + Vinyl Cutters = Bolstered K–3 Math Curriculum

(Grades K–3) *200 A/B, Convention Center*

Science Focus: ETS, SEP2, SEP5, SEP6

Ryan Erickson (@cpmakerspace; *ryan.erickson@district196.org),* Cedar Park Elementary STEM School, Apple Valley, Minn.

The Maker Movement is spreading across the country. Laser cutters, 3D printers, vinyl cutters, and more are starting to show up in elementary schools. Connecting students with experiential learning not only bolsters student engagement, but also solidifies learning through making. Join in for simple ways to connect the Maker Movement, 3D printers, laser cutters, and vinyl cutters to K–3 math standards.

11:00 AM–12 Noon Featured Presentation

Wearable Technology and the Connected World

(Grades 6–College) *205 A/B, Convention Center*

Science Focus: ETS

Lucy Dunne (@LucyEDunne; *ldunne@umn.edu),* Associate Professor and Director, Apparel Design Program, University of Minnesota, Minneapolis

Presider: Steven Walvig, Teaching Science in a Connected World Strand Leader, and The Bakken Museum, Minneapolis, Minn.

As wearable technology matures in the consumer market, the scope of applications is broadening and the influence of emerging technologies is becoming more evident. What influence will wearables have on education, and what does the rise of an interdisciplinary field like wearable technology mean for education? This talk will discuss current trends, emerging research, and potential implications for wearables in the classroom.

Lucy Dunne *founded the Wearable Technology Lab at the University of Minnesota in 2008. Her background spans apparel design, computer science, and electronic engineering. Lucy teaches in the Apparel Design undergraduate program and the Apparel Studies graduate program and is a member of the graduate faculty in Human Factors and Ergonomics and Product Design. In 2013, she was awarded the NSF CAREER award and NASA's Silver Achievement Medal for her research, teaching, and outreach activities. She is the co-author of* Functional Clothing Design: From Sportswear to Space Suits.

11:00 AM–12 Noon Presentations

NSELA-Sponsored Session: Tools for Science Leaders, Part 2

(General) *Marquette VIII, Hilton*

Science Focus: GEN

Keri Randolph (@nselascience; *randolph.keri@gmail.com),* NSELA President, and Hamilton County Dept. of Education, Chattanooga, Tenn.

Come learn about the various tools and strategies that science leaders can use to enhance teaching and learning in their outreach.

NESTA and CIESIN Share: Exploring a Compendium of Online Resources for Teaching Earth Science

(Grades 5–12) *Minneapolis E–G, Hilton*

Science Focus: ESS

Michael Passow *(michael@earth2class.org),* Dwight Morrow High School, Englewood, N.J.

NESTA members will share exemplary educational websites, including the Center for International Earth Science Information Network, to help implement *NGSS* and state curricular standards programs.

Using Learning Progressions to Better Integrate Instruction and Assessment in Three Dimensions

(Grades K–8) *Symphony IV, Hilton*

Science Focus: GEN, NGSS

Eric Greenwald *(eric.greenwald@berkeley.edu),* The Lawrence Hall of Science, University of California, Berkeley

We will examine how short-term learning progressions (e.g., for an instructional unit) can help teachers monitor and support student progress toward three-dimensional performance expectations.

Up, Up, and Away: Stratospheric Ballooning in STEM Education

(Grades 6–College) *200E, Convention Center*

Science Focus: ESS2.A, ESS2.D, ETS1, ETS2.A, LS1.B, LS3.B, LS4.C, PS1.A, PS2.C, PS4.B, CCC1, CCC2, CCC4, CCC7, SEP1, SEP3, SEP4, SEP6, SEP8

Erin Boltik *(eboltik@isd271.org)* and **Kelly Henry** *(kahenry99@gmail.com),* Bloomington (Minn.) Public Schools

Joy Kalkofen (@jkalkofen; *jkalkofen@isd271.org),* Oak Grove Middle School, Minneapolis, Minn.

Adam Kimpton, Olson Middle School, Minneapolis, Minn.

Learn about stratospheric ballooning for sending science experiments to the edge of space and back. You will engage students while integrating across all four STEM areas.

Authors Needed! Learn How to Prepare and Submit Your Manuscript to an NSTA Journal

(General) *201 A/B, Convention Center*

Science Focus: GEN

Ken Roberts (*ken_r@nsta.org*), Assistant Executive Director of Journals, NSTA, Arlington, Va.

Meet with NSTA journal editors to learn how to successfully prepare and submit an article for publication.

Forensic Anthropology: A STEAM Approach to Teaching the Skeletal System

(Grades 7–9) *203 A/B, Convention Center*

Science Focus: LS1, CCC3, SEP4, SEP5, SEP7, SEP8

Alison Seymour, Ridgecrest Intermediate School, Rancho Palos Verdes, Calif.

Discover a series of lessons that incorporate science, technology, math, art, and history with hands-on activities including a graveyard crime. Lesson handouts.

Grey Matter: Learning and Teaching Science with the Brain in Mind

(General) *205C, Convention Center*

Science Focus: GEN, NGSS

Carolyn Hayes (@caahayes; *caahayes@comcast.net),* NSTA Retiring President, and Retired Educator, Greenwood, Ind.

Through science activities, experience how discoveries in cognitive neuroscience are applied to *NGSS* teaching strategies and the principles of how students learn science.

Assessing Students Through Google Forms

(Grades 7–College) *205D, Convention Center*

Science Focus: GEN

Katie Melgaard (@kamelgaard; *kmelgaard@mccfreeze.org),* Marshall County Central High School, Newfolden, Minn.

Google Forms is a free program that can replace paper quizzes. It can grade as much or as little as you want and provide quick feedback to students.

Addressing Five Common Myths About the *Next Generation Science Standards*

(Grades K–12) *206 A/B, Convention Center*

Science Focus: GEN, NGSS

Kenneth Huff *(kenneth.huff@roadrunner.com),* NSTA Director, Middle Level Science Teaching, and Williamsville (N.Y.) Central School District

Do you find that fellow teachers or administrators still have misconceptions about the *NGSS?* Join a member of the *NGSS* writing team to learn how you can help colleagues better understand the *NGSS.*

11:00 AM–12 Noon Hands-On Workshops

Elementary and Middle School STEM Activities
(Grades 2–9) *Marquette I/II, Hilton*
Science Focus: ETS1, PS2.A, PS2.C, CCC4, CCC6, CCC7, SEP1, SEP2, SEP3, SEP4, SEP5, SEP6, SEP8
Donald Powers *(DT-Powers@wiu.edu),* Western Illinois University, Macomb
Emphasis will be placed on activities that integrate engineering and technology activities appropriate for elementary and middle school classrooms. *NGSS* connections will be included.

Understanding Seed Dispersal with Engineering Practices and Trade Books
(Grades 1–6) *Marquette III, Hilton*
Science Focus: LS, SEP
Lloyd Barrow *(barrowl@missouri.edu),* University of Missouri, Columbia
Emphasis will be placed on how elementary teachers can use engineering practices in their seed unit. Misconceptions need to be considered in selecting trade books.

Room for Robots
(Grades K–5) *Marquette IX, Hilton*
Science Focus: GEN, SEP5
Jill Jensen (@GHSTEAMchic; *jill.jensen@district196.org),* Glacier Hills Elementary School of Arts and Science, Eagan, Minn.
Robots are engaging resources, but how do you find time? Learn how Glacier Hills Elementary School of Arts and Science is finding room for robots.

Science/Math Integration for a Sustainable Planet
(Grades 3–6) *Rochester, Hilton*
Science Focus: ESS3.A, ESS3.C, ESS3.D, LS2.A, LS4.D, CCC1, CCC2, CCC3, CCC4, CCC7, SEP
Angela Lawrence (@lawrencea12; *lawrencea@district112.org),* Eastern Carver County Schools, Saint Louis Park, Minn.
Discover hands-on activities on real-world human ecology concepts (population growth, natural resource use, and biodiversity) while building foundational math skills. Take home a CD-ROM of lessons.

Let's Get Physical—From Force and Friction to Water and Weather
(Grades P–3) *200C, Convention Center*
Science Focus: PS
Ruth Ruud *(ruudruth61@gmail.com),* Cleveland State University, Cleveland, Ohio
Juliana Texley *(texle1j@cmich.edu),* 2014–2015 NSTA President, and Central Michigan University, Mount Pleasant
Don't look now, but the *CCSS* asks that you teach physical sciences as early as kindergarten, and the *NGSS* have specific goals for early primary. No more procrastinating! The good news is that you have your equipment. Come get easy activities, lit basics, and basic teacher background so that you can start right away!

Moon Mania: Modeling Lunar Phases
(Grades 6–8) *200D, Convention Center*
Science Focus: ESS1.B, CCC1, CCC3, CCC4, SEP2, SEP4, SEP7
Christine Shupla (@LIPToday; *shupla@lpi.usra.edu),* Lunar and Planetary Institute, Houston, Tex.
Carol Waters (@MrsH20sScience; *cwaters@pasadenaisd.org),* Pasadena (Tex.) ISD
Wendell Colston *(wcolston@pasadenaisd.org),* Southmore Intermediate School, Pasadena, Tex.
Carrie Stokes *(cstokes@hcde-texas.org),* Harris County Dept. of Education, Houston, Tex.
Conduct innovative hands-on activities to build an understanding of the lunar cycle and explore kinesthetic models to assess student understanding of phases.

AAPT Session: Physics on the Cheap
(Grades 9–12) *200F, Convention Center*
Science Focus: PS
Jon Anderson *(jpanderson@isd12.org),* Centennial High School, Circle Pines, Minn.
Emphasis will be placed on making and using equipment for teaching physics. See some pieces of equipment demonstrated, and watch video of other pieces of equipment.

ACS Middle Level Session: Density: A Molecular View
(Grades 6–8) *200G, Convention Center*
Science Focus: PS1.A
James Kessler and **Patricia Galvan** *(p_galvan@acs.org),* American Chemical Society, Washington, D.C.
Explore and identify materials based on density through hands-on activities and molecular models from the free completely developed 5E lesson plans available at *www.middleschoolchemistry.com.*

ASEE Session: Digital Electronics Demystified—From "0" to "1" in a Single Session
(Grades 10–College) *200I, Convention Center*
Science Focus: ETS
Andrew Tubesing, University of St. Thomas, Saint Paul, Minn.
Learn the theoretical and technical foundations on which digital electronics are built and design your own digital circuit that makes a logical decision.

Expanding STEM Skills
(Grades K–12) *200J, Convention Center*
Science Focus: GEN, CCC, SEP
Tim Barrett *(tbarrett@mhta.org),* Minnesota High Tech Association, Minneapolis
Cheryl Moeller (@STEMAhead; *cheryl@hightechkids.org),* High Tech Kids, Minneapolis, Minn.
Brenda Barrett, Frassati Catholic Academy, Saint Paul, Minn.
Many STEM skills are adequately addressed by traditional lessons. However, this workshop will demonstrate particular skills that are enhanced with the use of creative games/activities.

NSTA Press® Session: Argumentation in the Biology Science Classroom
(Grades 5–College) *208 C/D, Convention Center*
Science Focus: LS
Sharon Schleigh *(sharonpschleigh@gmail.com),* East Carolina University, Greenville, N.C.
In this hands-on workshop, learn how to engage in scientific argumentation to support teaching in your classrooms. Sample activities from the NSTA Press books provided.

Science and Literacy: Science Learning from the Works of Scientists
(Grades 6–12) *208A, Convention Center*
Science Focus: INF, SEP
Beth Murphy *(bethmurphy@me.com),* The Bakken Museum, Minneapolis, Minn.
Elizabeth Stretch *(elizabeth.stretch@mpls.k12.mn.us),* Minneapolis (Minn.) Public Schools
Explore strategies and resources to actively engage secondary science students in investigating challenging text, including primary sources from the history of science, to promote content knowledge and scientific thinking. This session is based on a grant-funded teacher professional development program offered by The Bakken Museum to address the *CCSS* for Literacy in Science and Technical Subjects.

11:00 AM–12 Noon Exhibitor Workshops

What's the Problem? Integrating Engineering into the Science Classroom Without Bridges and Rockets
(Grades 6–9) *101 I/J, Convention Center*
Science Focus: ETS, SEP
Sponsor: AEOP eCYBERMISSION
Matthew Hartman, eCYBERMISSION Content Manager, NSTA, Arlington, Va.
Problem solving is a skill that all science students must have, and it can be learned through engineering. Come learn some new ways to bring engineering ideas and problem solving into your grades 6–9 science classroom beyond the old and stale examples of building bridges or rockets. Discussion includes the online STEM competition eCYBERMISSION and how you and your students can participate at no cost.

What Is Amplify Science?
(Grades K–8) *101A, Convention Center*
Science Focus: GEN, NGSS
Sponsor: Amplify
Rebecca Abbott *(amplifyscience@berkeley.edu)* and **Traci Shields** *(amplifyscience@berkeley.edu),* The Lawrence Hall of Science, University of California, Berkeley
Explore Amplify Science, the newest breakthrough curriculum from University of California Berkeley's Lawrence Hall of Science for grades K–8. Discover how the immersive program, built from the ground up for *NGSS,* engages students as scientists and engineers to solve real-world problems.

The GMO Debate Rages On!
(Grades 9–College) *101B, Convention Center*
Science Focus: LS
Sponsor: Bio-Rad Laboratories
Leigh Brown, Bio-Rad Laboratories, Hercules, Calif.
Are GM crops a good thing? Do all countries have the same GM food labeling requirements? Learn more about GMOs and how to test for the presence of GM content in foods. Join a debate and learn how to bring this experience to your classroom.

Exploring Misconceptions: There's a Difference Between Heat and Temperature?!?
(Grades 6–12) *101C, Convention Center*
Science Focus: PS1, PS3
Sponsor: PASCO scientific
Michael Blasberg *(blasberg@pasco.com),* PASCO scientific, Roseville, Calif.
Are heat and temperature the same thing or are they different? This hands-on workshop using SPARKvue and wireless temperature sensors will provide you with effective new ways to teach the concepts of heat and temperature, central to physical science.

Effective Teaching Resources for AP Chemistry
(Grades 9–12) *101D, Convention Center*
Science Focus: PS
Sponsor: Pearson
Ed Waterman, Retired Educator, Fort Collins, Colo.
Join Ed Waterman and explore how this book concisely summarizes all the important content in the six big ideas and 117 learning objectives of the chemistry curriculum framework.

Biological Balance: Skin Color, Reproductive Fitness, and Vitamin D Deficiency
(Grades 9–12) *101E, Convention Center*
Science Focus: LS3
Sponsor: HHMI BioInteractive
Dawn Norton, Minnetonka High School, Minnetonka, Minn.
Discover HHMI BioInteractive activities to teach the evolutionary implications for skin pigmentation as it relates to folate levels and the risk of severe birth defects and low sperm counts—as an alternative hypothesis for the selective pressure that drove the evolution of darker skin for protection against UV radiation.

Autopsy: Forensic Dissection Featuring Carolina's Perfect Solution® Pigs
(Grades 6–12) *101F, Convention Center*
Science Focus: LS
Sponsor: Carolina Biological Supply Co.
Carolina Teaching Partner
Are you ready for a forensic dissection activity that is on the cutting edge? Engage students and revitalize your mammalian structure and function lessons with a real classroom autopsy. Participants dissect a Carolina's Perfect Solution pig by modeling the protocols of a professional forensic pathologist. This exciting workshop features our exclusive Carolina's Perfect Solution preserved specimens.

Chemical Formula and Amino Acids
(Grades 9–12) *101G, Convention Center*
Science Focus: PS1.A, PS2.B, CCC3, SEP3, SEP4
Sponsor: LAB-AIDS®, Inc.
Brandon Watters, Vernon Hills High School, Vernon Hills, Ill.
What is the difference between subscripts and coefficients? What does "balancing" a chemical equation mean? Many students have trouble with these concepts. If a student does not fully understand the chemical formula, then moles, reactions, and stoichiometry are hopelessly confusing. Join us for intuitive lessons for all students to master the formula, gaining a deeper understanding of chemistry.

Biology with Vernier
(Grades 9–12) *101H, Convention Center*
Science Focus: LS, SEP3, SEP4
Sponsor: Vernier Software & Technology
David Carter *(info@vernier.com),* Vernier Software & Technology, Beaverton, Ore.
In this hands-on workshop, learn how Vernier supports biology teachers who want their students to use probeware. A variety of experiments from our popular biology lab books will be conducted. Learn how our innovative data-collection technology works across multiple platforms such as LabQuest 2, computer, Chromebook, and iPad.

CONNECTIONS: Three-Dimensional Learning by National Geographic Explorers
(Grades 1–5) *102 A/B, Convention Center*
Science Focus: GEN, NGSS
Sponsor: National Geographic Learning | Cengage Learning
Tom Hinojosa, National Geographic Learning | Cengage Learning, Littleton, Colo.
See how National Geographic provides your students with new, relevant, and natural examples of the three dimensions of crosscutting concepts, disciplinary core ideas, and science and engineering practices through the research being done by explorers all around the world. Learn how to incorporate these models to guide your instruction and energize student interest in science.

Telling Stories with David Goodsell's Watercolor Molecular Landscapes

(Grades 9–College) *102 E/F, Convention Center*

Science Focus: LS1, CCC3, CCC6, SEP2

Sponsor: MSOE Center for BioMolecular Modeling

Tim Herman *(herman@msoe.edu),* MSOE Center for BioMolecular Modeling, Milwaukee, Wis.

Use these amazing landscapes to explore cell structure and illustrate where in the cell protein synthesis and other important processes occur. You can also tell molecular stories such as "Your Flu Shot in Action," tracing the production of an antibody protein all the way to its release into the circulation.

Bring Science to Life Through Elementary Robotics with LEGO Education WeDo 2.0

(Grades 2–4) *102C, Convention Center*

Science Focus: ESS, ETS, LS, PS

Sponsor: LEGO Education

Kathy Grotta *(kathy.grotta@lego.com),* LEGO Education, Boston, Mass.

Looking for more project-based lessons for your elementary science classroom? Join us for a hands-on session to explore the new WeDo 2.0, which combines core science concepts with robotics to bring your science classroom to life. The WeDo 2.0 curriculum includes getting started, guided practice, and open-ended projects presented through an interactive software that teaches programming. Build a robot and explore the software including a look at the documentation tool. Attendees will NEED to have WeDo 2.0 software downloaded to device before workshop! For Android, Chromebook, and iPad, go to app store and look for LEGO Education WeDo 2.0 FULL. For Mac and PC, go to *education.lego.com/en-us/educationdownloads.*

12:30–1:30 PM Presentations

Equity in Science Education Roundtable

(General) *Conrad B/C, Hilton*

Science Focus: GEN

Jerry Valadez *(jdvscience@yahoo.com),* NSTA Director, Multicultural/Equity in Science Education, and California State University, Fresno

The Equity in Science Education Roundtable includes participants in the development of a framework that NSTA will use in developing strategies for equity and inclusion.

NARST-Sponsored Session: Making Sense of Student Sense Making in Oral Presentations of Independent Research Projects

(Grades 5–8) *Marquette IV, Hilton*

Science Focus: GEN, SEP7

Michele Hollingsworth Koomen *(mkoomen@gac.edu),* **Alissa Hoffman** *(ahoffma5@gustavus.edu),* and **Elizabeth Schutz** *(eschutz@gustavus.edu),* Gustavus Adolphus College, Saint Peter, Minn.

Gillian Roehrig (@ghroehrig; *roehr013@umn.edu),* STEM Education Center, St. Paul, Minn.

Sarah Weaver *(weave048@umn.edu),* University of Minnesota Monarch Lab, Saint Paul

Review findings from research on middle school students' scientific explanations in school science fairs. Participants will use our explanation assessment tools to evaluate explanation scenarios.

A Picture-Perfect Approach to Connecting Reading Strategies and Science

(Grades K–5) *Marquette V, Hilton*

Science Focus: ETS, PS, SEP1, SEP2, SEP3, SEP4, SEP6, SEP8

Kimberly Stilwell (@kimstillwellNSTA; *kimstilwell@k-16resources.com),* Picture-Perfect Science, West Chester, Ohio

Need ideas to connect literacy and science? Never before has it been so easy to interest students in reading and science! *Picture-Perfect Science Lessons* combine the appeal of children's picture books with standards-based science content. Leave with ideas on how to begin the integration in your classroom.

Science Snippets

(Grades 1–6) *Rochester, Hilton*

Science Focus: GEN, CCC, SEP1, SEP7

Victoria Rosin *(rosinvk@uwec.edu),* University of Wisconsin–Eau Claire

Find out how to use short (five minutes or less) and repeatable science demonstrations to help build links between science lessons, children's literature, and writing.

Engaging Students in Science Through Virtual Field Trips

(Grades K–12) *200 A/B, Convention Center*

Science Focus: GEN

Dacia Jones ((@dacia92; *teachingwithstyle09@gmail.com),* Educational Consultant, Durham, N.C.

Tap into how to use social media and internet resources to design a "virtual field trip" for your students through the integration of science, ELA, and social studies.

"Bee" STEMified: The Powerful Story of the Pollinator…Revealed Through Collaborative Effort

(Grades 4–12) *200C, Convention Center*

Science Focus: ETS2, LS2

Kelli Ellickson *(kelli.ellickson@district196.org),* Cedar Park Elementary STEM School, Rosemount, Minn.

Erin Rupp ((@pollinatemn; *erin@pollinatemn.org),* Pollinate Minnesota, Minneapolis

Honeybees are fascinating, essential to our survival, and a pressing scientific issue. Translate today's science, policy, and media story of pollinator decline into interdisciplinary lessons.

Teach Evolution with the World's Most Extravagant Birds

(Grades 6–12) *203 A/B, Convention Center*

Science Focus: LS

Kelly Schaeffer ((@BirdSleuth; *kms448@cornell.edu),* The Cornell Lab of Ornithology, Ithaca, N.Y.

Watch out Darwin's finches…a brighter bird is the new biology teacher in town! Learn to teach evolution and natural selection through the birds-of-paradise.

Dumbledore's Transfiguration Class: Science and Magic from Hogwart's Academy

(Grades 2–9) *205 A/B, Convention Center*

Science Focus: GEN, NGSS

Alan McCormack *(amccorma@mail.sdsu.edu),* 2010–2011 NSTA President, and San Diego State University, San Diego, Calif.

Magical and scientific events highlight adventures of Harry Potter in the worldwide children's literature series. Moaning Myrtle, Fawkes the Phoenix, and Hedwig the Owl will be guests! Wands optional.

Writing to Improve Science Understanding

(Grades 6–8) *205C, Convention Center*

Science Focus: GEN, NGSS

Renae Lenhardt *(renae.lenhardt@anoka.k12.mn.us),* Anoka-Hennepin School District, Anoka, Minn.

Hear how to guide students' science writing to improve understanding and application of science content, problem analysis, and as evidence for argumentation.

Blended Science: Personalizing the Flip

(Grades 6–12) *205D, Convention Center*

Science Focus: GEN, NGSS

Carolyn Fruin ((@cfruin; *cfruin65@gmail.com),* Capella University, Minneapolis, Minn.

Applying new technologies can be a scary thing. It's even scarier when they fail. Come learn how to find and evaluate tools you can use for building out a more personalized science classroom. Walk away with at least one fun application you can start using next week!

Inspire by Example: Role Models in the Classroom

(Grades 6–12) *206 A/B, Convention Center*

Science Focus: ETS2, INF

Leah Defenbaugh ((@leahdeeda; *ldefenbaugh@tpt.org)* and **Sarah Carter** *(scarter@tpt.org),* Twin Cities Public Television, Saint Paul, Minn.

Role models create possibilities and connect classroom to career. Learn how to inspire your students by successfully integrating effective role models into classroom instruction. Hear about *SciGirls,* a multiplatform STEM education program that is changing how millions of girls think about, engage in, and pursue STEM studies and career paths.

12:30–1:30 PM Hands-On Workshops

NMLSTA-Sponsored Session: Get Wet! Teaching Students About the Great Lakes Using Engineering Design

(Grades 5–9) *Marquette I/II, Hilton*

Science Focus: ETS

Mary Lou Lipscomb *(mllscience@aol.com),* NMLSTA President, Naperville, Ill.

Kathy Biernat *(kbiernat@stmaryeg.org),* St. Mary's Visitation School, Franklin, Wis.

Engage in a fun STEM activity highlighting science and engineering practices (SEPs), designed for middle level learners, and that can be implemented next week.

Science Notebooks—From Preservice to the Classroom

(Grades 3–6/College) *Marquette III, Hilton*

Science Focus: GEN, SEP

Bill Lindquist (@wlind77; *wlindquist02@hamline.edu),* Hamline University, Saint Paul, Minn.

Caroline Beattie *(cbeattie@flaschools.org),* Lino Lakes Elementary School, Circle Pines, Minn.

Amy Peterson *(apeterson1114@gmail.com),* Student, Bayport, Minn.

Science notebooks provide powerful tools to engage *NGSS* practices. Discover how Hamline University's teacher education program prepares preservice teachers to successfully implement notebooks in their classroom.

Build, Ignite, and Launch

(Grades 5–12) *200D, Convention Center*

Science Focus: ETS, SEP

Brad Blue *(bradbblue@gmail.com),* Design & InnoVation Lab, Minneapolis, Minn.

Based on the scaffolded rockets and launch systems—from simple to complex—in the movie *October Sky,* students build rockets as well as ignition systems to launch their rockets.

AAPT Session: Particle Physics in the Classroom

(Grades 9–12) *200F, Convention Center*

Science Focus: PS, SEP4

Shane Wood *(shane.wood@moundsviewschools.org),* Irondale High School, Shoreview, Minn.

Trigger excitement by bringing the Higgs boson, anti-matter, and the search for extra dimensions into your classroom from QuarkNet.

ACS Middle Level Session: The Water Molecule and Dissolving

(Grades 6–8) *200G, Convention Center*

Science Focus: PS1.A

James Kessler and **Patricia Galvan** *(p_galvan@acs.org),* American Chemical Society, Washington, D.C.

Explore the polarity of the water molecule and identify substances based on their solubility using hands-on activities and molecular animations from the free website *www.middleschoolchemistry.com.*

ASEE Session: Engineering Design: A Template for Critical Considerations in Integrated STEM Education

(Grades 6–9) *200I, Convention Center*

Science Focus: ETS, SEP1, SEP2, SEP3

Deborah Besser (@Deb_Besser; *bess8866@stthomas.edu),* University of St. Thomas, Saint Paul, Minn.

Debra Monson *(debbie.monson@stthomas.edu),* University of St. Thomas, Minneapolis Campus, Minneapolis, Minn.

Experience and consider the critical lesson elements needed in an authentic real-world engineering design lesson.

Creating a Standards-Based Learning Experience for Students

(Grades 7–12) *200J, Convention Center*

Science Focus: GEN, NGSS

Mark Peterson ((@dassel; *mpeterson@bsmschool.org),* Benilde-St. Margaret's High School, Minneapolis, Minn.

Amanda Meyer ((@alynnmeyer; *alynnmeyer@gmail.com),* Springfield (Minn.) Public Schools

Engage in an active session about the shift to a standards-based learning environment from two science teachers committed to this classroom journey.

NSTA Press® Session: Reimagining the Science Department

(Grades 7–12) *208 C/D, Convention Center*

Science Focus: GEN, NGSS

Wayne Melville *(wmelvill@lakeheadu.ca),* Lakehead University, Thunder Bay, Ont., Canada

Todd Campbell ((@dtcampbe; *todd.campbell@uconn.edu),* University of Connecticut, Storrs Mansfield

Doug Jones *(douglas_jones@lakeheadschools.ca),* Sir Winston Churchill Collegiate & Vocational Institute, Thunder Bay, Ont., Canada

Emphasis will be placed on strategies for the collaborative work of departments supportive of *NGSS* implementation.

What Do You Mean I Have to Teach Engineering?

(Grades 7–College) *208A, Convention Center*

Science Focus: ETS1, PS

Gregory Dodd *(gbdodd@gmail.com),* George Washington High School, Charleston, W.Va.

We will focus on engineering design by engaging in a hands-on STEM activity on how a colorimeter works and how to design and use a simple colorimeter.

12:30–1:30 PM Exhibitor Workshops

An *NGSS* Approach to Engineering in the Upper Grade Bands

(Grades 6–12) *101 I/J, Convention Center*

Science Focus: ETS, SEP2, SEP3, SEP7

Sponsor: Houghton Mifflin Harcourt

Michael DiSpezio, Author and STEM Specialist, North Falmouth, Mass.

Join educator, broadcast host, and Houghton Mifflin Harcourt author Michael DiSpezio for an engaging and informative workshop that addresses the *NGSS* approach to engineering and the engineering design process in the upper grade bands. In this hands-on session, you will work in multidisciplinary teams as you participate in several activities that profile and address a standards-based approach to engineering.

How to Use Pop Culture in Your Life Science Class

(Grades 9–College) *101B, Convention Center*

Science Focus: LS

Sponsor: Bio-Rad Laboratories

Leigh Brown, Bio-Rad Laboratories, Hercules, Calif.

Use popular science to engage high school and college students in your classroom. See how popular TV shows and movies connect to real-world discoveries and issues. Learn how to use examples like DNA fingerprinting to make gel electrophoresis the foundation of a fun hands-on lab that increases student involvement and understanding.

Science Denial: Why Does It Seem to Be Increasing… and What Can Educators Do About It?

(General) *101D, Convention Center*

Science Focus: ESS3, LS4, CCC, SEP

Sponsor: Pearson

Kenneth Miller, Brown University, Providence, R.I.

Vaccination, climate change, evolution, GMOs—denial of mainstream science seems to be everywhere, from pop culture to politics. Ken Miller, lead witness in the Kitzmiller "intelligent design" trial, will discuss what causes science denial and what science educators can do about it.

A Prep-"Free" ELISA Activity with HHMI BioInteractive's Immunology Virtual Lab

(Grades 9–12) *101E, Convention Center*

Science Focus: LS

Sponsor: HHMI BioInteractive

Timothy Guilfoyle, Phillip O. Berry Academy of Technology, Charlotte, N.C.

Introduce students to the exciting field of immunology by actively engaging them in an ELISA test to determine if patients are positive for systemic lupus erythematosus. Take home free classroom-ready resources—requiring no lab prep—from HHMI BioInteractive. Resources are suitable for all levels of high school biology.

Engineer Hands-On Chemistry Fun with a Carolina STEM Challenge®!

(Grades 6–12) *101F, Convention Center*

Science Focus: ETS, PS

Sponsor: Carolina Biological Supply Co.

Carolina Teaching Partner

Bounce your way into hands-on chemistry activities that challenge your middle school and high school students to use their critical-thinking skills. Apply the engineering process while exploring the chemistry of mixtures and polymers. See how Carolina makes it easy to incorporate STEM into your classroom.

What Is a Species?

(Grades 9–12) *101G, Convention Center*

Science Focus: LS4.A, LS4.D, CCC2, SEP6, SEP7, SEP8

Sponsor: LAB-AIDS®, Inc.

Dawn Posekany, Solon High School, Solon, Iowa

In this activity from the SEPUP high school biology program, learn about conditions that lead to speciation, including isolation due to temporal, geographical, and behavioral factors, and more. Then apply this knowledge to determine whether selected animal or plant pairs are in the early, mid, or late stages of speciation.

Integrating Chromebook with Vernier Data-Collection Technology

(Grades 3–12) *101H, Convention Center*

Science Focus: GEN, SEP3, SEP4

Sponsor: Vernier Software & Technology

David Carter *(info@vernier.com),* Vernier Software & Technology, Beaverton, Ore.

Collecting and analyzing data help students learn critical science concepts that increase test scores and promote science inquiry. In this hands-on workshop, learn how Vernier supports teachers who use Chromebook devices in their classrooms. Experiments such as "Boyle's Law," "Grip Strength Comparison," and "Ball Toss" will be conducted.

Let Your *NGSS* and *CCSS* Lessons Take Flight!

(Grades 3–6) *102 A/B, Convention Center*

Science Focus: PS, SEP

Sponsor: Pitsco Education

Erron Sagen *(erron.sagen@oshkosh.k12.wi.us),* Oakwood Environmental Education Charter School, Oshkosh, Wis.

Lee Siudzinski *(lee@blueskyfoundation.org),* Blue Sky Educational Foundation, Three Lakes, Wis.

The ability to fly has enthralled humankind for thousands of years. Teaching an aviation curriculum in a classroom that integrates *NGSS* and *CCSS* is the perfect way to motivate students to learn and apply the four forces of flight in their own lives through hands-on activities and physics concepts.

Making Student Engagement with Science Practices Meaningful

(Grades 6–8) *102C, Convention Center*

Science Focus: PS, CCC2, CCC4, SEP1, SEP2, SEP6, SEP7, SEP8

Sponsor: Activate Learning

Heather Milo, Activate Learning, Greenwich, Conn.

We all know that science connects to our everyday lives, but how do we support students to see and feel these connections? Come experience how a modeling activity leverages students' experiences, ideas, and language as the entry point into a series of investigations about the particulate nature of matter.

1:15–2:00 PM Special Session

Meet the Presidents and Board/Council

(General) *NSTA Exhibits (Hall C) Entrance, Convention Center*

Be sure to stop by for this special session. Come "meet and greet" with your elected NSTA officers on your way to the exhibits. The President, President-Elect, and Retiring President along with your Board and Council members are looking forward to talking with you at the conference!

2:00–3:00 PM Exhibitor Workshops

Gains in the Education of Mathematics and Science: What Can GEMS Do for You?
(Grades 5–12) *101 I/J, Convention Center*
Science Focus: GEN
Sponsor: AEOP eCYBERMISSION
Sue Whitsett *(aeopgems@nsta.org),* AEOP Project Director, NSTA, Arlington, Va.
Receive an overview of the AEOP GEMS programs and find out how you can incorporate similar ideas and practices into your science classroom.

Using the Classic Demonstration to Engage Students in Science Talk
(Grades 6–College) *101A, Convention Center*
Science Focus: PS
Sponsor: South Dakota State University
Matthew Miller *(matt.miller@sdstate.edu),* South Dakota State University, Brookings
The Department of Chemistry and Biochemistry at South Dakota State University offers an online MS in Chemistry for teachers. Join us as we show and discuss a variety of safe demonstrations for engaging students in the classroom, similar to activities in the MS program.

How Do You Know What Fish Species You Are Eating? DNA Barcoding!
(Grades 9–College) *101B, Convention Center*
Science Focus: GEN, NGSS
Sponsor: Bio-Rad Laboratories
Leigh Brown, Bio-Rad Laboratories, Hercules, Calif.
How many aquatic species are there in the world? DNA barcoding has shown that there may be more than were ever thought to exist. Can you be certain the sushi you are eating is really what you think it is? Many instances of fish mislabeling (sometimes even endangered species) have also been brought to light through DNA barcoding activities. Learn more about this fascinating topic and how you can apply it in your classroom.

New Tools, Insights, and Ways of Understanding Science with *Biology* by Miller and Levine
(General) *101D, Convention Center*
Science Focus: LS
Sponsor: Pearson
Kenneth Miller, Brown University, Providence, R.I.
What does *NGSS* require, really? Teaching content through process, inquiry, and narrative, author Ken Miller will walk you through the tools and insights that we've written into the Miller and Levine program that support *NGSS*-style teaching.

Ecology, Africa, and HHMI, Oh My!
(Grades 8–12) *101E, Convention Center*
Science Focus: LS2.C, LS2.D
Sponsor: HHMI BioInteractive
Kim Parfitt, Central High School, Cheyenne, Wyo.
Join us for this workshop where we will share new resources available from HHMI BioInteractive. Our focus will be on the ecology activities related to Gorongosa National Park and the numerous ways you can use them in your classroom.

Learning By Arguing: Claims, Evidence, and Reasoning
(Grades 6–8) *101F, Convention Center*
Science Focus: GEN
Sponsor: Carolina Biological Supply Co.
Carolina Teaching Partner
Middle school students naturally love to argue. How can we use scientific argumentation to produce real learning in the science classroom? Explore claims, evidence, and reasoning through practical real-world applications. Experience phenomena as delivered in the new Smithsonian Science and Technology Concepts (STC) Middle School program.

Cell Differentiation and Gene Expression
(Grades 9–12) *101G, Convention Center*
Science Focus: LS1.A, LS1.B, LS3.A, CCC1, CCC2, SEP6
Sponsor: LAB-AIDS®, Inc.
Dawn Posekany, Solon High School, Solon, Iowa
Students often have trouble conceptualizing how selective gene expression works. In this workshop, participants will use manipulatives to teach this concept and explain how it is connected to genetic engineering. Innovative activities are selected from the *Science and Global Issues: Biology* program from SEPUP and LAB-AIDS.

Integrating iPad with Vernier Data-Collection Technology
(Grades 3–12) *101H, Convention Center*
Science Focus: GEN, SEP3, SEP4
Sponsor: Vernier Software & Technology
David Carter *(info@vernier.com),* Vernier Software & Technology, Beaverton, Ore.
Collecting and analyzing data help students learn critical science concepts that increase test scores and promote science inquiry. In this hands-on workshop, learn how Vernier supports teachers who use iPads in their classrooms. Experiments such as "Boyle's Law," "Grip Strength Comparison," and "Ball Toss" will be conducted.

Engage with *NGSS* Using STEM Gauge™
(Grades K–8) *102 A/B, Convention Center*
Science Focus: GEN, NGSS
Sponsor: Measured Progress
Justine Hargreaves, Measured Progress, Dover, N.H.
Learn strategies for transition to the *NGSS* and gathering evidence of three-dimensional learning using STEM Gauge formative assessment tools. This interactive workshop highlights a variety of classroom strategies to engage students with assessment questions, rubrics, and self-reflection templates. Participants will get a free STEM Gauge topic set.

Zombie Apocalypse!
(Grades 6–12) *102 E/F, Convention Center*
Science Focus: GEN
Sponsor: Texas Instruments
Jeffrey Lukens, Sioux Falls (S.Dak.) School District
Be part of a zombie apocalypse! Learn about disease spread modeling using simulations and fun storylines about a zombie outbreak. Applicable for middle school and high school, this workshop is sure to scare you and your little zombies with its exciting Hollywood themes used to engage students learning science!

The Science of Invisibility Muggles!
(Grades 9–12) *102C, Convention Center*
Science Focus: PS4.B, CCC2, CCC6, SEP1, SEP3, SEP5
Sponsor: LASER Classroom™
Colette DeHarpporte *(colette@laserclassroom.com),* LASER Classroom, Minneapolis, Minn.
Recent advances have brought us closer than ever to mastering one of the holy grails of science—invisibility. This hands-on workshop uses a simple four lens setup to get a close look at using light's refractive property to create regions of invisibility. We also explore the math that makes it work, and how invisibility is useful to Muggles.

3:00–5:00 PM Meeting

CESI Board Work Session
Board Room 1, Hilton

3:00–5:00 PM Hands-On Workshop

ACS Session Three: Energy in Chemistry—An Atomic View
(Grades 9–12) *200H, Convention Center*
Science Focus: PS3, SEP6, SEP7
Marta Gmurczyk *(m_gmurczyk@acs.org),* American Chemical Society, Washington, D.C.
Jennifer Keil *(jenniferkeil11@gmail.com),* Thornton High School, Thornton, Colo.
Chad Bridle (@sciencebridle; *cbridle1@gpsbulldogs.org),* Grandville High School, Grandville, Mich.
Rebecca Stober, Mapleton Expeditionary School of the Arts, Denver, Colo.
Engage in argumentation activities focused on energy transfer at the atomic level by building arguments based on evidence and scientific models and ideas. These activities are designed to deepen students' conceptual understanding about atomic models of matter, quantization of energy, and atomic emission spectroscopy.

3:30–4:00 PM Presentation

NARST-Sponsored Session: What Can I Do and How Do I Get There? Trajectories of Science Teacher Learning
(Grades P–12) *Marquette IV, Hilton*
Science Focus: GEN
Julie Luft *(jaluft@uga.edu),* The University of Georgia, Athens
Shannon Dubois *(shannon.l.dubois@gmail.com),* Valparaiso University, Valparaiso, Ind.
Vanessa Kind, Durham University, County Durham, United Kingdom
Brooke Whitworth, Northern Arizona University, Flagstaff
Amanda Berry, RMIT University Bundoora Campus East, Bundoora, Victoria, Australia
We will share different pathways that science teachers can take during their careers…whether the goal is to become a department head or curriculum specialist.

3:30–4:30 PM Presentations

Disciplinary Literacy and Reading in the Content Area of Science: Yes! You Can Do Both as an Elementary Teacher!

(Grades K–5) *Marquette III, Hilton*

Science Focus: GEN, NGSS

Michele Hollingsworth Koomen *(mkoomen@gac.edu),* Gustavus Adolphus College, Saint Peter, Minn.

This session will provide elementary teachers with an understanding of what we mean by both reading in a content area like science and disciplinary literacy in science.

Teaching Grade 4 with the *NGSS*

(Grade 4) *Marquette V, Hilton*

Science Focus: ESS, ETS1, LS1, PS3, PS4, CCC1, CCC2, CCC4, CCC5, SEP1, SEP2, SEP3, SEP6, SEP8

Derek Brower, Northwestern College, Orange City, Iowa

Jennifer Peterson, Humboldt Elementary School, Humboldt, S.Dak.

Join in for resources, activities, lessons, and unit plans for grade 4 teachers adopting *NGSS.* Review results from a collaborative effort with grade 4 and preservice elementary teachers.

Nurturing Curious Minds: Exploring the Science Encountered in the Young Child's World and Inspiring Sustained Curiosity, Interest, and Learning

(Grades P–2) *Rochester, Hilton*

Science Focus: GEN, NGSS

Donna Knoell *(dknoell@sbcglobal.net),* Educational Consultant, Overland Park, Kans.

Join me as I model how to create opportunities for children to explore and manipulate materials and variables, and to examine the myriad examples of science in their everyday world, to ignite curiosity and a love of science.

Auto/Cars: A Fun and Relevant Way to Teach Physical Science (Chemistry) Concepts

(Grades 8–College) *200E, Convention Center*

Science Focus: PS, INF, CCC, SEP

Andrew Nydam *(andrewnydam@hotmail.com)*, Polymer Ambassador, Olympia, Wash.

Generate student interest and understanding of STEM with labs and demonstrations that relate automobiles to physical science (chemistry) concepts. *CCSS* correlations. Take home a CD of information.

The NSTA Learning Center: Free Professional Development Resources and Opportunities for Educators

(General) *201 A/B, Convention Center*

Science Focus: GEN

Flavio Mendez *(flavio_m@nsta.org),* Senior Director, NSTA Learning Center, NSTA, Arlington, Va.

Lost when it comes to finding online professional learning resources to enhance your content knowledge and skills? With more than 12,000 resources (25% of which are free) and quality PD opportunities to assist educators with core subject content, the Learning Center has the answers! Get free resources and ICE CREAM!

Edible Labs

(Grades 6–12) *203 A/B, Convention Center*

Science Focus: LS, PS

John Vaden *(vadenj@rcschools.net)* and **Lee Ann Richardson** *(richardsonl@rcschools.net),* Riverdale High School, Murfreesboro, Tenn.

Serve up new learning in your classroom. Edible labs allow teachers an innovative means of presenting science concepts such as DNA and density to diverse students using food.

NSTA Press® Session: Phenomenon-Based Formative Assessment Probes

(General) *205 A/B, Convention Center*

Science Focus: GEN, SEP

Page Keeley (@CTSKeeley; *pagekeeley@gmail.com),* 2008–2009 NSTA President, and The Keeley Group, Fort Myers, Fla.

Learn how the *Uncovering Student Ideas in Science* formative assessment probes elicit students' initial ideas about everyday phenomena and engage students in constructing explanations using disciplinary core ideas.

The Writing Practices of Scientists

(Grades 6–12) *205C, Convention Center*

Science Focus: GEN, SEP6, SEP7, SEP8

Jennifer Rose *(jennifer.rose@mpls.k12.mn.us)* and **Julie Tangeman** *(julie.tangeman@mpls.k12.mn.us),* Minneapolis (Minn.) Public Schools

Help your students think more deeply about science concepts and communicate their understandings in writing. Learn about researched-based strategies and tools to improve student achievement.

Evaluating the Design and Delivery of Online Courses Using POET

(College) *205D, Convention Center*

Science Focus: GEN, SEP8

Theresa Hornstein *(t.hornstein@lsc.edu),* Lake Superior College, Duluth, Minn.

Find out about POET (Program for Online Excellence in Teaching), designed by faculty to help faculty develop and evaluate online classes.

3:30–4:30 PM Hands-On Workshops

Deep Time

(Grades 4–8) *Conrad B/C, Hilton*

Science Focus: ESS1.C, ESS2.E, CCC3

Birgitta Meade (@birgittameade; *meadbi01@luther.edu)* and **Kayla Ingvalson** (@kaylakail; *ingvka01@luther.edu),* Luther College, Decorah, Iowa

Understanding the age of Earth is fundamental to understanding the changes in life on Earth. Discussion centers on experiences and readings for grades 4–8.

Taking STEM Outside

(Grades 4–6) *Marquette I/II, Hilton*

Science Focus: ETS1, LS1.A, LS1.B, LS2.A

Laura Duffey *(laura.duffey@state.mn.us),* Minnesota Dept. of Natural Resources, Saint Paul

Abbi Case (@planetabbi; *abbi.case@isd624.org),* Oneka Elementary School, Hugo, Minn.

In addition to hitting STEM benchmarks, learn how outdoor and placed-based science lessons can enhance students' knowledge of trees, forests, and the environment around them.

Inquiry and Self-Directed Learning

(Grades K–5) *Marquette IX, Hilton*

Science Focus: PS

Angela Lawrence (@lawrencea12; *lawrencea@district112.org*), Eastern Carver County Schools, Saint Louis Park, Minn.

Lori Mosser (@LoriMosser; *mosserl@district112.org*), Chaska Middle School West, Chaska, Minn.

Foster more questions and independent learning in your science classroom! Come explore 50 easy-to-use inquiry activities for students tied to the *NGSS* and aligned with the 5Es (Engage, Explore, Explain, Elaborate, Evaluate) around such topics as magnetism, matter, and weather.

Evolution for Educators

(Grades 6–8) *200 A/B, Convention Center*

Science Focus: LS4.B, LS4.C

Bertha Vazquez (@rdfrsTIES; *bertha@richarddawkins.net*), Richard Dawkins Foundation for Reason and Science, Coral Gables, Fla.

Cheryl Ann Hollinger (@cherylhollinger; *cheryl.hollinger@richarddawkins.net*), Teacher Institute for Evolutionary Science, Washington, D.C.

Explore how the Teacher Institute for Evolutionary Science strives to meet the needs of middle school science teachers as they cover the *NGSS* disciplinary core idea: Biological Evolution: Unity and Diversity.

NSTA Press® Session: *Argument-Driven Inquiry in Chemistry: Lab Investigations for Grades 9–12*

(Grades 9–College) *200C, Convention Center*

Science Focus: PS1.B, CCC, SEP

Victor Sampson (@drvictorsampson; *victor.sampson@gmail.com)* and **Ashley Hamill Murphy** *(ashley.hamill.murphy@gmail.com),* The University of Texas at Austin

Learn about Argument-Driven Inquiry and how it can help students learn how to use core ideas, crosscutting concepts, and science practice to explain natural phenomena.

NASA Earth Science: Real-World Connections to Data and Tools for Science Fairs

(Grades 8–12) *200D, Convention Center*

Science Focus: ESS2, ETS1

Cassie Soeffing (@NASAWavelength; @IGESNews; @sdbikegirl; *cassie_soeffing@strategies.org*) and **Theresa Schwerin** *(theresa_schwerin@strategies.org*), Institute for Global Environmental Strategies, Arlington, Va.

Join us as we share how NASA Earth system science resources can be used to support educators and students' as they prepare for science fair research projects. NASA develops new ways to observe and study Earth's interconnected natural

—*Photo courtesy of Jacob Slaton*

systems with long-term data records. Bring a laptop/tablet as we explore tools and resources in support of *NGSS* Earth's systems, weather and climate, and engineering design.

AAPT Session: Physics Make-and-Take Potpourri
(Grades 9–12) *200F, Convention Center*
Science Focus: PS
Jon Anderson (*jpanderson@isd12.org*), Centennial High School, Circle Pines, Minn.
Thomas Tomashek (*tom.tomashek@minnetonka.k12.mn.us*), Minnetonka High School, Minnetonka, Minn.
Make and take home some new laboratory and demonstration equipment for your classroom. Bring an idea/toy to share.

ACS Middle Level Session: Chemical Reactions: Breaking and Making Bonds
(Grades 6–8) *200G, Convention Center*
Science Focus: PS1.B
James Kessler and **Patricia Galvan** (*p_galvan@acs.org*), American Chemical Society, Washington, DC
Explore the production of a gas, a precipitate, and changes in temperature through hands-on activities and molecular model animations from the free completely developed 5E lesson plans available at *www.middleschoolchemistry.com*.

ASEE Session: ASEE's K–12 Outreach—Engineering, Go For It (eGFI), Teach Engineering, Link Engineering, and the National Science Digital Library
(Grades K–12) *200I, Convention Center*
Science Focus: ETS, SEP
Deborah Besser (@Deb_Besser; *bess8866@stthomas.edu*), University of St. Thomas, Saint Paul, Minn.
The American Society for Engineering Education (ASEE) and its K–12 division will introduce teachers to innovative ways to introduce engineering into the K–12 classroom.

Formative Assessment in the Standards-Based Science Classroom
(Grades 7–12) *200J, Convention Center*
Science Focus: GEN, NGSS
Mark Peterson (@dassel; *mpeterson@bsmschool.org*), Benilde-St. Margaret's High School, Minneapolis, Minn.
Amanda Meyer (@alynnmeyer; *alynnmeyer@gmail.com*), Springfield (Minn.) Public Schools
You understand the philosophy behind standards-based learning, but now what? Effective assessments are one key to a successful standards-based environment. Explore different options for formative and summative assessments that support continuous student learning in a science classroom.

NSTA Press® Session: Outdoor Science with Birds, Books, and Butterflies
(Grades P–8) *208 C/D, Convention Center*
Science Focus: GEN, CCC
Steve Rich (@bflyguy; *bflywriter@comcast.net),* University of West Georgia, Carrollton
Outdoors or in, discover engaging lesson ideas with natural materials, children's books, and citizen science. Join in for outdoor classroom basics, funding ideas, crosscutting concepts, and free seeds.

3:30–4:30 PM Exhibitor Workshops

Enzymes: Technology Inspired by Nature
(Grades 9–College) *101B, Convention Center*
Science Focus: PS
Sponsor: Bio-Rad Laboratories
Leigh Brown, Bio-Rad Laboratories, Hercules, Calif.
With rising greenhouse gases, scientists look to nature for a biofuel solution. The star of this hands-on workshop is the cellobiase enzyme, an engine for cellulosic biofuel production. Use the inquiry-based approach to extract enzyme, test activity, and design experiments to study how pH, temperature, and concentrations affect reaction rates.

Explore Biotechnology Using Free HHMI BioInteractive Resources
(Grades 9–12) *101E, Convention Center*
Science Focus: LS
Sponsor: HHMI BioInteractive
Sherry Annee, Brebeuf Jesuit Preparatory School, Indianapolis, Ind.
Learn about a lizard phylogeny virtual lab, bacterial identification virtual lab, and an interactive CSI elephant poaching mystery, which include topics such as DNA sequencing, PCR, gel electrophoresis, genetics, BLAST, and evolution.

Introduction to Wisconsin Fast Plants®
(Grades K–12) *101F, Convention Center*
Science Focus: LS
Sponsor: Carolina Biological Supply Co.
Carolina Teaching Partner
Experience the versatility of Wisconsin Fast Plants. These small, quick-growing plants engage students, suit all learning levels, and let you integrate plant development, life cycle, environmental effects, genetics, and evolution into your instruction. Learn the basics for successful planting, flower dissection, and pollination.

Energy Flow Through an Ecosystem
(Grades 9–12) *101G, Convention Center*
Science Focus: ETS1.B, LS2.B, LS2.C, PS3.D, CCC4, CCC5, CCC7, SEP2, SEP6, SEP7
Sponsor: LAB-AIDS®, Inc.
Dawn Posekany, Solon High School, Solon, Iowa
Use an interactive card sort of organism cards and ecosystem events to predict the effect of different events on the food web and the ecosystem. Then construct an energy pyramid to examine how much energy is stored at each level of a food web.

Physics and Physical Science with Vernier
(Grades 7–12) *101H, Convention Center*
Science Focus: PS, SEP3, SEP4
Sponsor: Vernier Software & Technology
David Carter *(info@vernier.com),* Vernier Software & Technology, Beaverton, Ore.
In this hands-on workshop, you will learn how Vernier supports physics and physical science teachers who want their students to use probeware. A variety of experiments from our popular lab books will be conducted. Learn how our innovative data-collection technology works across multiple platforms such as LabQuest 2, computer, Chromebook, and iPad.

Science Through Engineering Design…and a Squid!
(Grades 6–12) *102 E/F, Convention Center*
Science Focus: ETS1, CCC, SEP
Sponsor: Texas Instruments
Fred Fotsch, Texas Instruments, Dallas
Using technology and the design iteration process are great ways to engage students in learning science. This exciting workshop challenges participants to build solutions to interesting scenarios. Searching for giant squid, growing food in space, and exploring Mars are some of the challenges!

5:00–5:30 PM Presentations

The Transition—From STEM Student to STEM Teacher

(Grades 7–12) *200C, Convention Center*

Science Focus: GEN, SEP3

Rachelle Haroldson, University of Wisconsin–River Falls
Nichelle Wollberg, Lake Holcombe School, Holcombe, Wis.
Chelsey Turner, Viking Middle School, Woodville, Wis.

First-year teachers who went through a STEM teacher preparation program will share their experiences transitioning from being a STEM student to a STEM teacher.

Why Are There Science Teachers in My Math Class?

(Grades 11–College) *205C, Convention Center*

Science Focus: GEN, SEP5

Aminul Huq *(ahuq@r.umn.edu)* and **Lorraine Dame** *(lfdame@r.umn.edu),* Center for Learning Innovation, University of Minnesota, Rochester

Find out how to enhance integrated mathematics classes through cross-disciplinary collaborative instruction in an active learning environment.

STEM for All: Connecting K–12 with College Through Science Museums

(General) *205D, Convention Center*

Science Focus: INF

Leah Ritz, The Science Zone, Casper, Wyo.

Let's examine a successful collaboration effort, brainstorm gaps in STEM education in your communities, identify key stakeholders, and discuss how to leverage them.

5:00–6:00 PM Presentation

Science in the News

(Grades 6–College) *206 A/B, Convention Center*

Science Focus: ETS2, SEP7, SEP8

Rama Devagupta *(rama_devagupta@msn.com),* Southridge High School, Kennewick, Wash.

Do your students show lack of interest in science? Do you wonder: "Given this lack of interest, how can I inspire students to appreciate science?" Come to this session for answers.

5:00–6:00 PM Hands-On Workshops

NASA Brings You Newton's Laws of Motion

(Grades 4–11) *Conrad B/C, Hilton*

Science Focus: PS2, PS3, CCC2, CCC5

David Beier *(david.beier@barstowschool.org),* The Barstow School, Kansas City, Mo.

This hands-on workshop, developed and presented by a NASA Astrophysics Ambassador, will let you experience over 25 quick and easy Newton's laws of motion classroom activities you can use next week. Free NASA giveaways!

Direct Measurement Video for Science Inquiry

(Grades 9–College) *200 A/B, Convention Center*

Science Focus: PS, CCC1, CCC2, CCC3, SEP

Peter Bohacek (@bohacekp; *peter.bohacek@isd197.org),* Henry Sibley High School, Saint Paul, Minn.

Direct Measurement Videos allow students to explore, learn, and apply physics ideas to real-world situations. Find out why Direct Measurement Videos are used by over 1,000 students and teachers per day. Bring a laptop or iPad to access videos.

Using Recreational UAVs (Drones) for STEM Activities and Science Fair Projects

(Grades 6–12) *200D, Convention Center*

Science Focus: ESS, ETS, CCC3, SEP1, SEP3, SEP4, SEP6, SEP8

Margaret Mooney *(margaret.mooney@ssec.wisc.edu),* University of Wisconsin–Madison

Engage students in STEM using the "it" toy of the year—Unmanned Aerial Vehicles (UAVs or drones)! Try free teacher-developed activities for STEM learning.

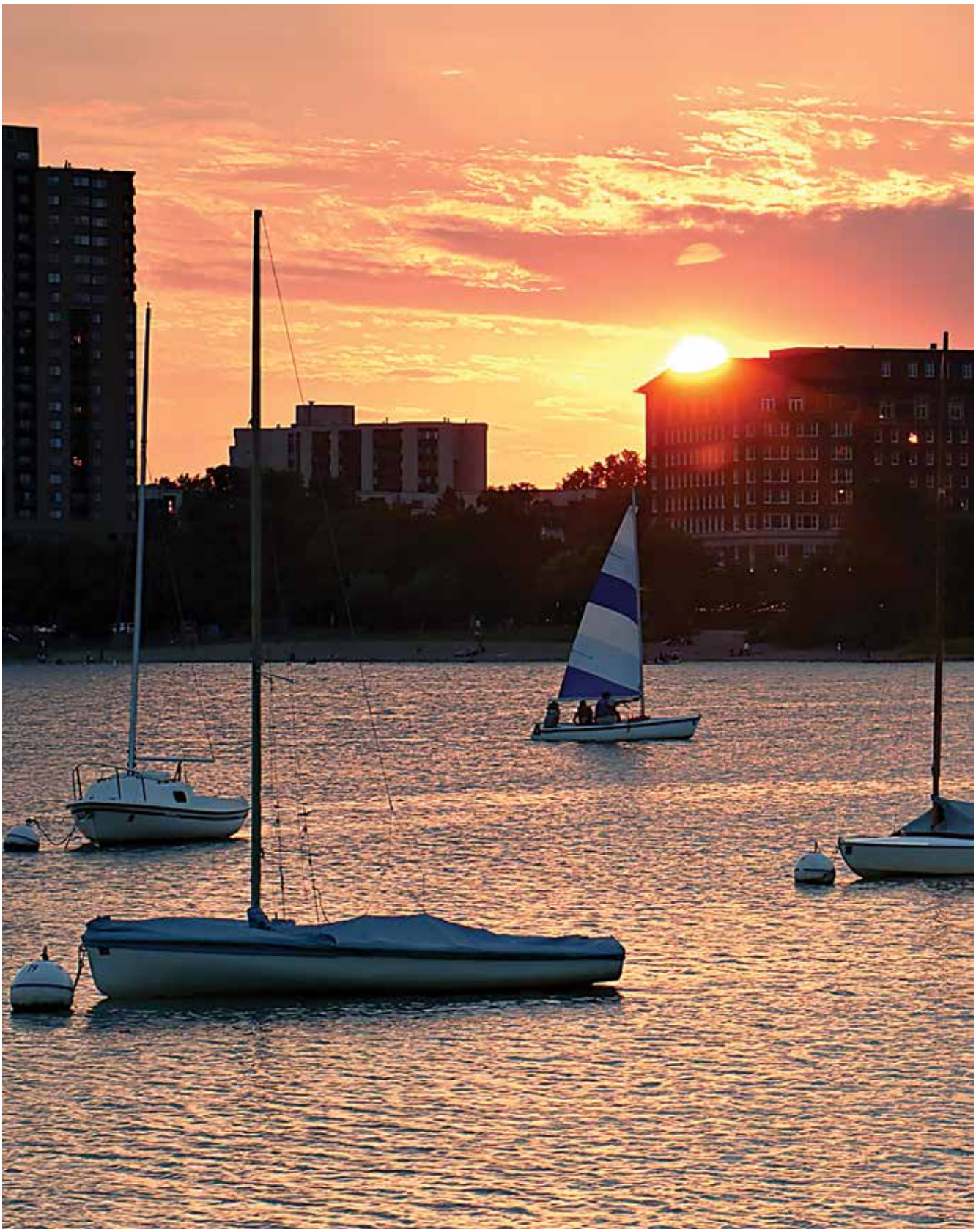
Learn How to Use a Modeling Approach to Teach Chemistry Concepts

(Grades 7–12) *208 C/D, Convention Center*

Science Focus: PS1.A, PS1.B, PS3.B, PS3.D, CCC3, CCC4, CCC5, CCC6, SEP1, SEP2, SEP4, SEP5, SEP6, SEP7, SEP8

Elizabeth Seibel-Hunt *(bseibelhunt@spa.edu),* St. Paul Academy and Summit School, Randolph Campus, Saint Paul, Minn.

Discover how to teach introductory chemistry following the modeling approach developed by the American Modeling Teaching Association curriculum. I'll unveil four models that help deepen understanding of particle interactions, gas law reasoning, energy transfer, and limiting stoichiometry reaction problems. Learn about this elegant evidence-based curriculum and how it has empowered students to learn the fundamentals of chemistry.



Boaters enjoy a leisurely sail as the Sun sets on Lake Calhoun.

Along the Minnehaha creek is a 53-foot waterfall, Minnehaha Falls, which is situated three quarters of a mile from where the stream empties into the Mississippi River. The name Minnehaha comes from the Dakota language and translates as "curling water."

8:00–9:00 AM Presentations

Coral Reefs: Fragile Wonders Under Threat: Bring Vibrant Environmental Stewardship Lessons to Your Students with Free NOAA Resources

(Grades 5–12) *200D, Convention Center*

Science Focus: ESS, LS, PS, CCC

June Teisan (@jlteisan; *june.teisan@noaa.gov),* NOAA Office of Education, Washington, D.C.

Coral reefs are a stunning global treasure, but these fragile ecosystems are under increasing threat from pollution, harmful fishing practices, and ocean acidification. Even areas far from coasts can impact marine health. Incorporate coral reefs into your existing curriculum—biology, chemistry, climate studies, and more—using lesson plans, demos, labs, activities, and multimedia from the National Oceanic and Atmospheric Administration (NOAA).

Science and Literacy in Action

(Grades 4–8) *200F, Convention Center*

Science Focus: GEN, SEP

Nancy Galas *(nancygalas@gmail.com),* Educational Consultant, Saint Charles, Ill.

Rebecca D'Angelo *(rdangelo@elmhurst205.org),* Lincoln Elementary School, Elmhurst, Ill.

Mary Greska *(mgreska@elmhurst205.org),* Edison Elementary School, Elmhurst, Ill.

Join panelists as they model a science investigation that involves participants in the process of selecting problems for shared inquiry and individual investigations.

Basic Polymer Science for the Science Classroom

(Grades 6–12) *200G, Convention Center*

Science Focus: PS1.A, PS1.B, CCC6

Debbie Goodwin *(nywin@hotmail.com),* Retired High School Science Teacher, Chillicothe, Mo.

Simple demonstrations, labs, and activities bring polymers that are STEM relevant into your curriculum. Concepts include formation, classification, structure, and properties. I'll share *NGSS* correlations and a CD of activities/information.

Bringing the Abstract to Life with Live Animals in the Classroom

(Grades 5–College) *201 A/B, Convention Center*

Science Focus: LS, CCC

Mike Billington (@RaptorsRCool; *mbilling@umn.edu),* The Raptor Center, Saint Paul, Minn.

Join me for a demonstration of the potential impact live animals have on learning through the story of the peregrine falcon, its near extinction, and remarkable recovery.

Developing Science Process Skills Through School Yard Investigations

(Grades K–12) *203 A/B, Convention Center*

Science Focus: LS, INF

Lindsay Glasner (@BirdSleuth; *lig27@cornell.edu),* The Cornell Lab of Ornithology, Ithaca, N.Y.

Meeting standards goes hand in hand with student investigations and citizen science. Motivate students with school yard projects and real data…you'll be inspired with ideas and free resources!

Using Engineering Design to Collaboratively Create Engineering Design

(Grades 3–College) *205C, Convention Center*

Science Focus: ETS1, SEP

Ken Turner, Jr. *(kturner@dbq.edu),* University of Dubuque, Iowa

Melissa Kirby *(kirbym@kmsd.edu),* Kettle Moraine High School, Wales, Wis.

The problem-solving orientation of engineering design is the perfect means for teachers to use when collaboratively creating a lesson or unit using engineering design.

3D Printing in the K–12 Classroom

(Grades 1–12) *205D, Convention Center*

Science Focus: ETS

Jack Samuelson *(jacksamuelson@icloud.com),* Dr. STEM Express, Milwaukee, Wis.

Discover the opportunities and challenges of 3D printing in the classroom, as well as the considerations involved when choosing a printer for your school.

Habitat Connections: Action Through Citizen Science and Creating Bird-Friendly School Yards

(Grades 1–8) *206 A/B, Convention Center*

Science Focus: LS, INF

Barbara Jacobs-Smith *(barbara.jacobs-smith@breckschool.org),* Breck School, Golden Valley, Minn.

Involve students in citizen science, habitat improvements, and exciting investigations. Connecting students to school habitats builds scientific and environmental literacy. Materials and free resources provided.

8:00–9:00 AM Hands-On Workshops

Exploring the Trade-Offs and Payoffs of Sustainable Bioenergy Through Simulations and Field Data

(Grades 7–College) *200C, Convention Center*

Science Focus: ESS3, LS2, CCC1, CCC3 CCC5, SEP1, SEP4, SEP7

Leith Nye (@GLBioenergy; *leith.nye@wisc.edu),* University of Wisconsin–Madison

Students play an online game and analyze current data from university research to construct arguments about the most sustainable methods for growing bioenergy crops.

Teaching Kinematics with Programmable Cars

(Grades 9–College) *200H, Convention Center*

Science Focus: PS2.A, PS2.B, CCC1, CCC3, CCC4, SEP2, SEP3, SEP4, SEP5

Sam Terfa (@SamTerfa; *samterfa@gmail.com),* Minnehaha Academy Upper School, Minneapolis, Minn.

This hands-on session explores the use of LEGO® NXT programmable cars in helping students create mathematical models of accelerating linear and rotational motions.

Demystifying STEM: Collaborate…Don't Isolate

(Grades 5–12) *200I, Convention Center*

Science Focus: ESS, ETS2, CCC4, SEP1, SEP2, SEP4, SEP8

Barry Fried *(bfriedfab4@optonline.net),* Independent Consultant, East Meadow, N.Y.

Honora Dash *(hdash@schools.nyc.gov),* Edward R. Murrow High School, Brooklyn, N.Y.

Learn how the implementation of the three dimensions of *NGSS* in a STEM and science classroom promotes an exciting inquiry-based and collaborative learning culture, integrates a transdisciplinary approach with real-world connections, and uses authentic problem-based experiences to foster a deeper science understanding while students learn to provide solutions to science and engineering challenges.

Pedagogical Practices in Literacy to Enhance Inquiry-Based Instruction

(Grades 4–8) *200J, Convention Center*

Science Focus: GEN, NGSS

Jennifer Richards *(jennifer.richards@utk.edu),* The University of Tennessee Institute of Agriculture, Knoxville

Scientific inquiry intrinsically supports literacy skills and concepts. Explore creative ways to integrate strong pedagogical practice enhancing science instructional quality and student learning.

NSTA Press® Session: *Argument-Driven Inquiry in Biology: Lab Investigations for Grades 9–12*

(Grades 9–College) *208 C/D, Convention Center*

Science Focus: LS3, CCC, SEP

Victor Sampson (@drvictorsampson; *victor.sampson@gmail.com),* The University of Texas at Austin

Discover Argument-Driven Inquiry and how it can help students learn how to use core ideas, crosscutting concepts, and science practices to explain natural phenomena.

8:00–9:00 AM Exhibitor Workshops

Investigate Photosynthesis and Cellular Respiration with Algae Beads

(Grades 8–College) *101B, Convention Center*

Science Focus: LS

Sponsor: Bio-Rad Laboratories

Leigh Brown, Bio-Rad Laboratories, Hercules, Calif.

Use algae beads in a colorimetric assay to study both photosynthesis and cellular respiration in authentic inquiry investigations (AP Biology Big Idea 2: Labs 5 and 6). Learn how to extend this lab to study the effects of light intensity, light color, temperature, and other organisms on these processes.

Photosynthesis and Respiration—It's a Plant's Life!

(Grades 9–12) *101G, Convention Center*

Science Focus: LS, CCC3, SEP1, SEP3, SEP4, SEP5

Sponsor: LAB-AIDS®, Inc.

Rachel Sauvola, New Richmond High School, New Richmond, Wis.

Help your students sprout and grow with a different approach to teaching photosynthesis and cellular respiration. Learn how to captivate students through inquiry activities that can challenge and excite them. Easily implement activities into your current biology or plant science class.

Genes, Genomes, and Personalized Medicine
(Grades 9–College) *102 E/F, Convention Center*
Science Focus: LS4, CCC2, CCC6, SEP2, SEP6
Sponsor: MSOE Center for BioMolecular Modeling
Tim Herman *(herman@msoe.edu),* MSOE Center for BioMolecular Modeling, Milwaukee, Wis.
Introduce students to the science of genomics and personalized medicine with interactive DNA models and gene maps. We will tell a genomic story of how whole genome sequencing has been used to reach a molecular diagnosis of a disease.

Riding the Wave with TCI
(Grades K–5) *102C, Convention Center*
Science Focus: PS4
Sponsor: TCI
Brian Thomas *(info@teachtci.com),* TCI, Cincinnati, Ohio
With TCI's Bring Science Alive! programs, participants will be fully immersed in a lesson learning the ideas of science by actually "doing" science rather than just memorizing facts. Using a powerful online learning system to develop a model of waves to describe patterns in terms of amplitude and wavelength, participants will experience learning from a student's perspective. Leave with tools to implement hands-on, in-class investigations that work seamlessly with interactive technology.

8:00 AM–5:00 PM Meeting

Discover the *NGSS* Train-the-Trainer Workshop
(By Preregistration Only) *Conrad A, Hilton*
This workshop gives teacher leaders a solid understanding of the *NGSS,* tools for conducting teacher training, and the ongoing support they need to be leaders.

9:00 AM–12 Noon Exhibits

Hall C, Convention Center
The NSTA Exhibit Hall is a must-see! NSTA brings you the leading science education companies and organizations to showcase products, services, curricula, and much more. You'll discover something new and exciting in the world of science teaching. Some exhibitors will offer materials for sale.

9:30–10:30 AM Presentations

Polar ICE: Bringing Polar Research to Your Classroom
(Grades 6–College) *200D, Convention Center*
Science Focus: ESS3, CCC, SEP
Liesl Hotaling (@PolarICE_Ed), Eidos Education, Highlands, N.J.
Learn about polar research and the impact of climate change. Polar Interdisciplinary Coordinated Education (ICE) is an integrated education and outreach program designed to provide public access to the Antarctic and Arctic regions through polar data, observations, and interactions with the scientists. Leave with data-focused activities and visualization tools to connect your students to the poles.

Reading, Writing, and Speaking Science
(Grades 2–12) *200F, Convention Center*
Science Focus: GEN, SEP1, SEP2, SEP4, SEP5, SEP6, SEP7, SEP8
Erika Stewart *(jestewart2009@yahoo.com)*, Clinton Middle School, Clinton, Wis.
Integrate *CCSS ELA* into your classroom. Gain knowledge and learn strategies about how to successfully use collaborative conversations in elementary science.

Biomedical Engineering STEM Lessons
(Grades 7–8) *205C, Convention Center*
Science Focus: ETS, LS, SEP2
Alison Seymour, Ridgecrest Intermediate School, Rancho Palos Verdes, Calif.
Andrew Seymour *(seymo081@umn.edu),* University of Minnesota, Minneapolis
Learn about biomedical engineering and middle school lessons to engage your students in this exciting field. Background, resources, and lessons plans will be presented.

Deepening Understanding of Nature of Science Through a Class Wiki Project
(Grades 5–8) *205D, Convention Center*
Science Focus: GEN, SEP1, SEP8
Liz Bergeron, University of Wisconsin–La Crosse
Wikis are powerful Web 2.0 tools that build connections across content. Find out how to use a class wiki to deepen nature of science understanding. Leave with the technical knowledge required to implement wikis in your classroom.

Let's Talk Labs—Why and How?
(Grades 7–12) *208A, Convention Center*
Science Focus: GEN, SEP
Carolyn Fruin (@cfruin; *cfruin65@gmail.com),* Capella University, Minneapolis, Minn.
Investigations as authentic learning is crucial to students, including simulations and write-ups…but how do we fit it all in? Learn how to use simulations to promote inquiry as well as how to use peer grading to promote scientific literacy for all students and make your feedback more efficient.

9:30–10:30 AM Hands-On Workshops

Dissecting Animals? Frog-get About It!
(Grades 5–College) *200 A/B, Convention Center*
Science Focus: LS
Samantha Suiter (@samsuiter; *samanthas@peta.org),* People for the Ethical Treatment of Animals, Norfolk, Va.
Get hands-on experience with dissection software programs, covering educational efficacy, economic benefits, and current laws/policies regarding the use of animals in science.

Quake-Proof: Applying Newton's Laws of Motion to Building Design
(Grades 9–12) *200C, Convention Center*
Science Focus: ESS, PS, CCC2, SEP6
DeEtta Andersen *(dandersen2626@gmail.com),* Science Teacher, Center Point, Iowa
Through scientific inquiry, engineering practices, and mathematical calculations, students apply laws of motion to designing and testing earthquake-proof structures on simply made shake tables.

Pedagogical Decisions Using Atomic-Molecular Simulations/Models for Gas Pressure
(Grades 6–12) *200G, Convention Center*
Science Focus: PS1, SEP6
Collin Reichert *(collinreichert@gmail.com),* Ames High School, Ames, Iowa
Model pedagogical decisions while working with hand vacuum pumps and PhET simulations of atoms and molecules to better understand pressure in gases.

Connect Chemistry to Your World with ChemClub
(Grades 9–12) *200H, Convention Center*
Science Focus: PS1, INF
Karen Kaleuati (@acschemclubs; *k_kaleuati@acs.org),* American Chemical Society, Washington, D.C.
The ACS ChemClub program provides fun and educational resources—all for free! Find out about the program, try out some of the activities, and take home a copy of the resources.

What Do Engineers Do? Exploring Engineering Design in Your Elementary Classroom
(Grades 3–5) *200J, Convention Center*
Science Focus: ETS1, SEP
Steven Bernhisel *(steveb@linfield.edu),* Linfield College, McMinnville, Ore.
Let's explore what engineering is by using engaging, inexpensive, and safe activities designed to teach children about how engineering is conducted.

NSTA Press® Session: Argumentation in the Physical Science/Physics Classroom
(Grades 5–College) *208 C/D, Convention Center*
Science Focus: PS
Sharon Schleigh *(sharonpschleigh@gmail.com),* East Carolina University, Greenville, N.C.
In this hands-on workshop, learn how to engage in scientific argumentation to support teaching in your classrooms. Sample activities from the NSTA Press books provided.

9:30–10:30 AM Exhibitor Workshops

Build a Box: Engineering Food Dye Electrophoresis for *NGSS*

(Grades 7–College) *101B, Convention Center*

Science Focus: ETS, PS, SEP

Sponsor: Bio-Rad Laboratories

Leigh Brown, Bio-Rad Laboratories, Hercules, Calif.

In this hands-on workshop, see great ways to engage your students in engineering practices to study something they encounter in their everyday lives—food dyes! Have students engineer a protocol to separate and identify dyes using an integrated do-it-yourself electrophoresis box. It's a colorful way to introduce pipetting and electrophoresis skills in addition to chemistry and physics concepts.

Adding Some Color to Science

(Grades 9–12) *101G, Convention Center*

Science Focus: LS, CCC3, SEP1, SEP3, SEP4, SEP7, SEP8

Sponsor: LAB-AIDS®, Inc.

Rachel Sauvola, New Richmond High School, New Richmond, Wis.

Come discover pH is where it's at when it comes to flower color. A great hands-on activity that quickly demonstrates this awesome color change! Your students will love getting to the down and dirty of soil pH.

Of All the Nerve: Modeling Neurotransmission

(Grades 9–College) *102 E/F, Convention Center*

Science Focus: LS1, CCC, SEP

Sponsor: MSOE Center for BioMolecular Modeling

Tim Herman *(herman@msoe.edu),* MSOE Center for BioMolecular Modeling, Milwaukee, Wis.

Construct models of cholinergic, dopaminergic, and GABAergic synapses. Explore the role of various ions in action potential generation and neurotransmitter release. Visualize neurotransmitter synthesis using 3D-printed models. Handouts provided!

Bring Science to Life Through Elementary Robotics with LEGO Education WeDo 2.0

(Grades 2–4) *102C, Convention Center*

Science Focus: ESS, ETS, LS, PS, PS

Sponsor: LEGO Education

Kathy Grotta *(kathy.grotta@lego.com),* LEGO Education, Boston, Mass.

Looking for more project-based lessons for your elementary science classroom? Join us for a hands-on session to explore the new WeDo 2.0, which combines core science concepts with robotics to bring your science classroom to life. The WeDo 2.0 curriculum includes getting started, guided practice, and open-ended projects presented through an interactive software that teaches programming. Build a robot and explore the software including a look at the documentation tool. Attendees will NEED to have WeDo 2.0 software downloaded to device before workshop! For Android, Chromebook, and iPad, go to app store and look for LEGO Education WeDo 2.0 FULL. For Mac and PC, go to *education.lego.com/en-us/educationdownloads.*

11:00 AM–12 Noon Presentations

PolarTREC Greenland: Impact of Climate Change on Ecological Systems

(Grades 5–12) *200E, Convention Center*

Science Focus: ESS3, LS2.A, CCC, SEP

Anne Farley Schoeffler *(schoefflera@setoncatholicschool.org),* Seton Catholic School, Hudson, Ohio

Through ARCUS and PolarTREC, I participated in a research expedition to Greenland. I'll share my firsthand experience with the impact of climate change on this tundra ecosystem.

Spark Students' Curiosity with Chemistry!

(Grades K–12) *200H, Convention Center*

Science Focus: PS

Karen Kaleuati, American Chemical Society, Washington, D.C.

Did you know that the American Chemical Society (ACS) has resources for K–12 teachers, and you don't need to be a member? Find out about these free resources, including games, lesson plans, grants, and more.

Advancing Scientific Literacy with Inquiry Lesson Plans Using Science Reading Materials
(Grades 9–12) *201 A/B, Convention Center*
Science Focus: GEN, NGSS
Patrice Pages *(p_pages@acs.org),* American Chemical Society, Washington, D.C.
Promote critical thinking using standards-based inquiry lesson plans based on high-interest, scientifically accurate articles about topics relevant to high school students' everyday lives.

Infusing Creativity in the Classroom
(Grades P–5) *206 A/B, Convention Center*
Science Focus: ETS1, SEP1, SEP2, SEP3, SEP8
Melissa Brooks (@BrooksGH2), Glacier Hills Elementary School of Arts and Science, Eagan, Minn.
Explore how to implement a makerspace in your elementary classroom to extend student learning and knowledge of the engineering design process.

NSTA Press® Session: Teaching for Conceptual Understanding in Science
(General) *208 C/D, Convention Center*
Science Focus: GEN, SEP
Page Keeley *(pagekeeley@gmail.com),* 2008–2009 NSTA President, and The Keeley Group, Fort Myers, Fla.
What does it really mean to teach conceptually? Experience some tools and strategies to build a bridge between students' initial ideas and conceptual understanding.

Interactive Notebooks in the Secondary Science Classroom
(Grades 9–12) *208A, Convention Center*
Science Focus: GEN, NGSS
Tiffany Allen, Campus High School, Wichita, Kans.
Heard the hype about interactive notebooks, but unsure how to implement them in a secondary classroom? Gain insight from teachers successfully implementing this teaching structure.

11:00 AM–12 Noon Hands-On Workshops

Using News Media to Learn About Science in the Connected Science Classroom
(Grades 6–12) *200 A/B, Convention Center*
Science Focus: GEN, SEP8
G. Michael Bowen *(gmbowen@yahoo.com),* NSTA Director, District XVIII, and Mount Saint Vincent University, Halifax, N.S., Canada
Tony Bartley *(abartley@lakeheadu.ca),* Lakehead University, Thunder Bay, Ont., Canada
The new science framework calls for increased use of news media, including online news. We will examine issues with this and provide some solutions.

Engineering from Every Angle: Engineers as Proficient in Emotional Intelligence as Well as Analytical Skills
(Grades 5–8) *200C, Convention Center*
Science Focus: ETS, SEP
Jennifer Richards *(jennifer.richards@utk.edu),* The University of Tennessee Institute of Agriculture, Knoxville
Haley Holt (@GAMTTEP; @STEMSpark; *haley.holt@knoxschools.org),* L&N STEM Academy, Knoxville, Tenn.
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1-2-3 A-B-C: Strategies to Help Students Read Science Text, Graphs, and Diagrams
(Grades 6–12) *200D, Convention Center*
Science Focus: GEN
Nancy Orr-Johnson (@bio_nancy; *nancy.johnson@moundsviewschools.org),* Mounds View High School, Arden Hills, Minn.
Nancy Geving *(nancy.geving@spps.org),* Saint Paul (Minn.) Public Schools
Having trouble getting your students to understand the science textbook? Learn strategies to help students decode text and visuals to increase their science comprehension.

Teach Students to Read Like Scientists!
(Grades 4–8) *200F, Convention Center*
Science Focus: GEN
Ann Berg *(aberg@c-ischools.org),* Cambridge Middle School, Cambridge, Minn.
Explore strategies through interactive online simulations and activities that support success in reading science texts and, most importantly, scientific inquiry.

Infect Your Science Classroom with Math
(Grades 6–College) *200I, Convention Center*
Science Focus: GEN
Jeffrey Lukens *(jeffreylukens0613@gmail.com),* Sioux Falls (S.Dak.) School District
Integrating science and mathematics shouldn't just be a good idea, it should be the law! Come learn how easy, important, and fun it is to collect and analyze data as a part of good, solid, and responsible science education.

Coding in K–8 Classrooms—Start Them Early!
(Grades K–8) *200J, Convention Center*
Science Focus: ETS, SEP
Joan Biese (@gr1teacher; *jbiese@seymour.k12.wi.us),* Rock Ledge K–2 School, Seymour, Wis.
Computer science/coding websites and apps abound, with several focusing on young K–8 learners. Get them interested early; there are many benefits across the curriculum!


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March 31st
7:30am - 6:30pm
FRIDAY
April 1st
7:30am - 5:30pm
SATURDAY
April 2nd
SUNDAY
Join the Club
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Some exhibitors have classified their products by grade level and subject area. Subject areas are abbreviated here as follows:

Biology/Life Science	B
Chemistry/Physical Science	C
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Website: *www.nsta.org/stemforum*

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The National Science Teachers Association administers two U.S. Army STEM programs to engage students in real-world experiences. eCYBERMISSION is an online competition for students in grades 6–9and GEMS is a summer STEM enrichment program held at specific U.S. sites for students and teachers in grades 5–12.

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Washington, DC 20036 PreK–12
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Website: *www.acs.org/education*

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Exhibitors

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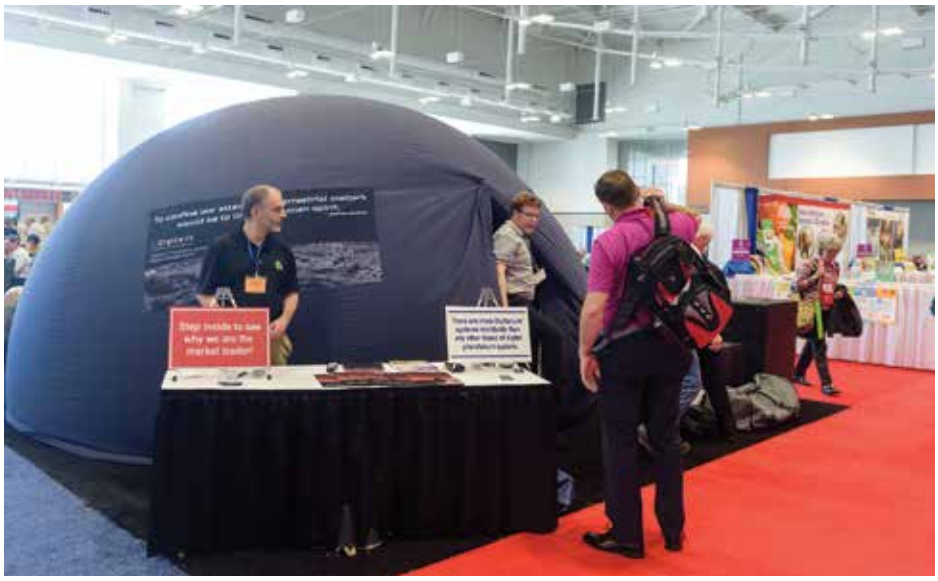

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Rosemount, MN 55068
Phone: 651-423-8368
E-mails: *billie.copley@dctc.edu*
Website: *www.nano-link.org*

Nano-Link: Center for Nanotechnology Education is funded by the National Science Foundation. One of the goals of Nano-Link is to provide educators with nanoscience content that can be easily integrated into the traditional classes they teach. Nano-Link believes that educators—armed with fun activities and good background—can ignite interest and excitement in students, not only for nanoscience but for STEM and science careers in general. Therefore, Nano-Link provides materials and content to educators at no cost (free).

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3D Molecular Designs (Booth #509)

Thursday, Oct 27	11:00 AM–12 Noon	102 E/F, Conv. Center	Dive In with Magnetic Water Molecules (p. 45)
Thursday, Oct 27	12:30–1:30 PM	102 E/F, Conv. Center	Constructing and Crossing Cell Membranes (p. 51)
Thursday, Oct 27	2:00–3:00 PM	102 E/F, Conv. Center	The Many Jobs of Proteins: Enzymes in the Spotlight (p. 57)
Friday, Oct 28	8:00–9:00 AM	102 E/F, Conv. Center	Let's Get Helical: Exploring DNA Structure and Function with Physical Models (p. 71)

Accelerate Learning–STEMscopes (Booth #409)

Thursday, Oct 27	11:00 AM–12 Noon	102 A/B, Conv. Center	The Value of Writing Scientific Explanations in STEM (p. 45)
Thursday, Oct 27	2:00–3:00 PM	102 A/B, Conv. Center	STEM Literacy: Strategies for Making Complex Text Meaningful (p. 57)
Friday, Oct 28	8:00–9:00 AM	102 A/B, Conv. Center	Building the Skills of Argumentation and Collaboration in STEM (p. 70)

Activate Learning (Booth #508)

Thursday, Oct 27	9:30–10:30 AM	102C, Conv. Center	Integrating Literacy and Science—The Wow Factor (p. 44)
Thursday, Oct 27	2:00–3:00 PM	102C, Conv. Center	Discourse Tools for Equitable and Rigorous Talk (p. 57)
Friday, Oct 28	12:30–1:30 PM	102C, Conv. Center	Making Student Engagement with Science Practices Meaningful (p. 86)

AEOP eCYBERMISSION (Booth #716)

Thursday, Oct 27	12:30–1:30 PM	101 I/J, Conv. Center	Too Many Ideas: Helping Students Focus and Select a Topic to Investigate (p. 50)
Friday, Oct 28	11:00 AM–12 Noon	101 I/J, Conv. Center	What's the Problem? Integrating Engineering into the Science Classroom Without Bridges and Rockets (p. 80)
Friday, Oct 28	2:00–3:00 PM	101 I/J, Conv. Center	Gains in the Education of Mathematics and Science: What Can GEMS Do for You? (p. 87

Amplify (Booth #415)

Thursday, Oct 27	8:00–9:00 AM	101A, Conv. Center	Experience Amplify Science: Grades K–1 (p. 40)
Thursday, Oct 27	9:30–10:30 AM	101A, Conv. Center	Experience Amplify Science: Grades 2–5 (p. 42
Thursday, Oct 27	11:00 AM–12 Noon	101A, Conv. Center	Experience Amplify Science: Middle School (p. 44)
Thursday, Oct 27	12:30–1:30 PM	101A, Conv. Center	What Is Amplify Science? (p. 50)
Friday, Oct 28	8:00–9:00 AM	101A, Conv. Center	Implementing Science Seminars and Scientific Argumentation with Amplify Science (p. 69)
Friday, Oct 28	9:30–10:30 AM	101A, Conv. Center	Not Your Typical Classroom Experience: Amplify Science's Digital Engineering Internships (p. 75)
Friday, Oct 28	11:00 AM–12 Noon	101A, Conv. Center	What Is Amplify Science? (p. 80)

ANATOMY IN CLAY® Learning System (Booth #802)

Friday, Oct 28	9:30–10:30 AM	102C, Conv. Center	Hands-On Approach to Teaching Anatomy and Physiology! (p. 76)

Bio-Rad Laboratories (Booth #605)

Friday, Oct 28	8:00–9:00 AM	101B, Conv. Center	Contagion! Track the Progress of Dangerous Viruses that Are Spreading Throughout the Country (p. 69)
Friday, Oct 28	9:30–10:30 AM	101B, Conv. Center	Investigate Photosynthesis and Cellular Respiration with Algae Beads (p. 75)
Friday, Oct 28	11:00 AM–12 Noon	101B, Conv. Center	The GMO Debate Rages On! (p. 80)
Friday, Oct 28	12:30–1:30 PM	101B, Conv. Center	How to Use Pop Culture in Your Life Science Class (p. 85)
Friday, Oct 28	2:00–3:00 PM	101B, Conv. Center	How Do You Know What Fish Species You Are Eating? DNA Barcoding! (p. 87)
Friday, Oct 28	3:30–4:30 PM	101B, Conv. Center	Enzymes: Technology Inspired by Nature (p. 92)

Bio-Rad Laboratories, cont.

Saturday, Oct 29	8:00–9:00 AM	101B, Conv. Center	Investigate Photosynthesis and Cellular Respiration with Algae Beads (p. 98)
Saturday, Oct 29	9:30–10:30 AM	101B, Conv. Center	Build a Box: Engineering Food Dye Electrophoresis for *NGSS* (p. 101)

Carolina Biological Supply Co. (Booth #401)

Thursday, Oct 27	8:00–9:00 AM	101F, Conv. Center	Waves, Waves, Waves: Building Models to Explain Phenomena (p. 41)
Thursday, Oct 27	9:30–10:30 AM	101F, Conv. Center	Engineer Excitement with a Carolina STEM Challenge® (p. 43)
Thursday, Oct 27	11:00 AM–12 Noon	101F, Conv. Center	Carolina's Young Scientist™ Dissections with Carolina's Perfect Solution® Specimen (p. 45)
Thursday, Oct 27	12:30–1:30 PM	101F, Conv. Center	Bring Visual Science into K–5 Classrooms—It's a Game Changer! (p. 50)
Thursday, Oct 27	2:00–3:00 PM	101F, Conv. Center	Keep Calm and Chemistry On: Successful Lab Activities for the New Chemistry Teacher (p. 56)
Thursday, Oct 27	3:30–4:30 PM	101F, Conv. Center	Hands-On Science with Classroom Critters (p. 61)
Friday, Oct 28	8:00–9:00 AM	101F, Conv. Center	Shark Dissection: A Jawsome Experience! (p. 70)
Friday, Oct 28	9:30–10:30 AM	101F, Conv. Center	The Best of Engineering for Elementary Students (p. 75)
Friday, Oct 28	11:00 AM–12 Noon	101F, Conv. Center	Autopsy: Forensic Dissection Featuring Carolina's Perfect Solution® Pigs (p. 81)
Friday, Oct 28	12:30–1:30 PM	101F, Conv. Center	Engineer Hands-On Chemistry Fun with a Carolina STEM Challenge®! (p. 86)
Friday, Oct 28	2:00–3:00 PM	101F, Conv. Center	Learning By Arguing: Claims, Evidence, and Reasoning (p. 87)
Friday, Oct 28	3:30–4:30 PM	101F, Conv. Center	Introduction to Wisconsin Fast Plants® (p. 92)

CPO Science/School Specialty Science (Booth #308)

Thursday, Oct 27	8:00–9:00 AM	101C, Conv. Center	CPO's Link™ with Car and Ramp: Force, Motion, and Variables (p. 40)
Thursday, Oct 27	11:00 AM–12 Noon	101C, Conv. Center	CPO's Link™ Genetics Learning Modules: Crazy Chromosomes and Crazy Traits (p. 44)
Thursday, Oct 27	12:30–1:30 PM	101C, Conv. Center	CPO's Wind Turbine: A STEM Approach to Engineering and Design (p. 50)
Thursday, Oct 27	2:00–3:00 PM	101C, Conv. Center	Building Electric Circuits with CPO's New Link™ Learning Module (p. 56)
Thursday, Oct 27	3:30–4:30 PM	101C, Conv. Center	CPO Science's Link™ Module: Learning About Chemistry Models (p. 60)

Delta Education/School Specialty Science (Booth #306)

Thursday, Oct 27	8:00–9:00 AM	101E, Conv. Center	Teach Next Gen Like Your Hair Is on Fire! (p. 41)
Thursday, Oct 27	9:30–10:30 AM	101E, Conv. Center	SEPs Made Easy (p. 43)
Thursday, Oct 27	11:00 AM–12 Noon	101E, Conv. Center	Build Skills to Boost the Makerspace Experience for Young Scientists! (p. 45)
Thursday, Oct 27	12:30–1:30 PM	101E, Conv. Center	STEM-gineering (p. 50)
Thursday, Oct 27	2:00–3:00 PM	101E, Conv. Center	Increase Your 3-D Vision of *NGSS* (p. 56)
Thursday, Oct 27	3:30–4:30 PM	101E, Conv. Center	Liven Up Literacy with Science (p. 60)

Delta Education/School Specialty Science–FOSS (Booth #306)

Thursday, Oct 27	8:00–9:00 AM	101D, Conv. Center	Wave Properties and Information Transfer (p. 41)
Thursday, Oct 27	9:30–10:30 AM	101D, Conv. Center	Engage Students in FOSS Next Generation (p. 43)

Delta Education/School Specialty Science–FOSS, cont.

Thursday, Oct 27	11:00 AM–12 Noon	101D, Conv. Center	The Reflective Assessment Practice: Improving Science Achievement in 10 Minutes (p. 45)
Thursday, Oct 27	12:30–1:30 PM	101D, Conv. Center	Scientific Practices: What Does Argumentation Look Like in an Elementary Classroom? (p. 50)
Thursday, Oct 27	2:00–3:00 PM	101D, Conv. Center	What Does Conceptual Modeling Look Like in an Elementary Classroom? (p. 56)
Thursday, Oct 27	3:30–4:30 PM	101D, Conv. Center	Evolutionary Evidence in the Fossil Record: Life Science with FOSS (p. 60)

Dinah.com (Booth #514)

Thursday, Oct 27	8:00–9:00 AM	101 I/J, Conv. Center	FOLD-tastic Science Notebooks via Dinah Zike's Notebook Foldables (p. 40)

Educational Innovations, Inc. (Booth #515)

Friday, Oct 28	9:30–10:30 AM	101 I/J, Conv. Center	Cool! Can We Do That Again?! (p. 75)

Edvotek Inc. (Booth #414)

Thursday, Oct 27	8:00–9:00 AM	101H, Conv. Center	Martian Genetics (p. 41)
Thursday, Oct 27	9:30–10:30 AM	101H, Conv. Center	Left at the Scene of the Crime: Introduction to Forensic Science (p.43)
Thursday, Oct 27	11:00 AM–12 Noon	101H, Conv. Center	Exploring the Genetics of Taste: SNP Analysis of the PTC Gene Using PCR (p. 45)
Thursday, Oct 27	12:30–1:30 PM	101H, Conv. Center	Outbreak! Zika Testing Using the Enzyme-Linked Immunosorbent Assay (ELISA) (p. 51)
Thursday, Oct 27	2:00–3:00 PM	101H, Conv. Center	Using Biotechnology to Diagnose HIV/AIDS (p. 57)
Thursday, Oct 27	3:30–4:30 PM	101H, Conv. Center	Environmental Toxicology Using Edvotek's New EZ-*elegans* (p. 61)

Flinn Scientific, Inc. (Booth #600)

Thursday, Oct 27	9:30–10:30 AM	101 I/J, Conv. Center	Year-Round Solutions for Success in AP Chemistry from Flinn Scientific (p. 42)
Thursday, Oct 27	2:00–3:00 PM	101 I/J, Conv. Center	Flinn Scientific's Exploring Chemistry™: Connecting Content Through Experiments (p. 56)
Friday, Oct 28	8:00–9:00 AM	101 I/J, Conv. Center	Fantastic Physical Science Demonstrations from Flinn Scientific (p. 69)

Frey Scientific/School Specialty Science (Booth #310)

Thursday, Oct 27	9:30–10:30 AM	101C, Conv. Center	Solving the Mystery of STEM Using Forensic Science (p. 42)

HHMI BioInteractive (Booth #510)

Friday, Oct 28	8:00–9:00 AM	101E, Conv. Center	Exploring a Genetic Trait with Stickleback Fish (p. 70)
Friday, Oct 28	9:30–10:30 AM	101E, Conv. Center	Connect Your Classroom with HHMI BioInteractive's Lizard Evolution Virtual Lab (p. 75)
Friday, Oct 28	11:00 AM–12 Noon	101E, Conv. Center	Biological Balance: Skin Color, Reproductive Fitness, and Vitamin D Deficiency (p. 81)
Friday, Oct 28	12:30–1:30 PM	101E, Conv. Center	A Prep-"Free" ELISA Activity with HHMI BioInteractive's Immunology Virtual Lab (p. 86)
Friday, Oct 28	2:00–3:00 PM	101E, Conv. Center	Ecology, Africa, and HHMI, Oh My! (p. 87)
Friday, Oct 28	3:30–4:30 PM	101E, Conv. Center	Explore Biotechnology Using Free HHMI BioInteractive Resources (p. 92)

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Houghton Mifflin Harcourt (Booth #614)

Thursday, Oct 27	11:00 AM–12 Noon	101 I/J, Conv. Center	An *NGSS* Approach to Engineering in the Upper Grade Bands (p. 44)
Thursday, Oct 27	3:30–4:30 PM	102D, Conv. Center	Exploring Video-Based Projects (p. 61)
Friday, Oct 28	8:00–9:00 AM	102D, Conv. Center	Exploring Video-Based Projects (p. 71)
Friday, Oct 28	12:30–1:30 PM	101 I/J, Conv. Center	An *NGSS* Approach to Engineering in the Upper Grade Bands (p. 85)

LAB-AIDS®, Inc. (Booth #412)

Thursday, Oct 27	8:00–9:00 AM	101G, Conv. Center	Gas Exchange (p. 41)
Thursday, Oct 27	9:30–10:30 AM	101G, Conv. Center	Modeling Convection Currents and Plate Motion (p. 43)
Thursday, Oct 27	11:00 AM–12 Noon	101G, Conv. Center	Calling All Carbons (p. 45)
Thursday, Oct 27	12:30–1:30 PM	101G, Conv. Center	Climate Proxies (p. 51)
Thursday, Oct 27	2:00–3:00 PM	101G, Conv. Center	Chemical Batteries (p. 57)
Thursday, Oct 27	3:30–4:30 PM	101G, Conv. Center	Reclaiming the Metal (p. 61)
Friday, Oct 28	8:00–9:00 AM	101G, Conv. Center	Waves (p. 70)
Friday, Oct 28	9:30–10:30 AM	101G, Conv. Center	pH Scale and Math Modeling (p. 75)
Friday, Oct 28	11:00 AM–12 Noon	101G, Conv. Center	Chemical Formula and Amino Acids (p. 81)
Friday, Oct 28	12:30–1:30 PM	101G, Conv. Center	What Is a Species (p. 86)
Friday, Oct 28	2:00–3:00 PM	101G, Conv. Center	Cell Differentiation and Gene Expression (p. 87)
Friday, Oct 28	3:30–4:30 PM	101G, Conv. Center	Energy Flow Through an Ecosystem (p. 92)
Saturday, Oct 29	8:00–9:00 AM	101G, Conv. Center	Photosynthesis and Respiration: It's a Plant's Life! (p. 98)
Saturday, Oct 29	9:30–10:30 AM	101G, Conv. Center	Adding Some Color to Science (p. 101)

LASER Classroom™ (Booth #420)

Thursday, Oct 27	12:30–1:30 PM	102C, Conv. Center	Bringing STEM to Light (p. 51)
Friday, Oct 28	2:00–3:00 PM	102C, Conv. Center	The Science of Invisibility Muggles! (p. 88)

Learning A–Z (Booth #615)

Thursday, Oct 27	12:30–1:30 PM	102 A/B, Conv. Center	Use Science to Teach Reading, Reading to Teach Science (p. 51)

LEGO Education (Booth #520)

Thursday, Oct 27	8:00–9:00 AM	102C, Conv. Center	Bring Science to Life Through Elementary Robotics with LEGO Education WeDo 2.0 (p. 41)
Friday, Oct 28	11:00 AM–12 Noon	102C, Conv. Center	Bring Science to Life through Elementary Robotics with LEGO Education WeDo 2.0 (p. 82)
Saturday, Oct 29	9:30–10:30 AM	102C, Conv. Center	Bring Science to Life through Elementary Robotics with LEGO Education WeDo 2.0 (p. 101)

Measured Progress (Booth #423)

Friday, Oct 28	2:00–3:00 PM	102 A/B, Conv. Center	Engage with *NGSS* Using STEM Gauge™ (p. 88)

miniPCR (Booth #305)

Friday, Oct 28	9:30–10:30 AM	102D, Conv. Center	miniPCR PTC Taster Lab—From Genotype to Phenotype (p. 76)

MSOE Center for BioMolecular Modeling (Booth #511)

Friday, Oct 28	9:30–10:30 AM	102 E/F, Conv. Center	3D Printing for the BioScience Classroom (p. 76)
Friday, Oct 28	11:00 AM–12 Noon	102 E/F, Conv. Center	Telling Stories with David Goodsell's Watercolor Molecular Landscapes (p. 82)
Saturday, Oct 29	8:00–9:00 AM	102 E/F, Conv. Center	Genes, Genomes, and Personalized Medicine (p. 99)
Saturday, Oct 29	9:30–10:30 AM	102 E/F, Conv. Center	Of All the Nerve: Modeling Neurotransmission (p. 101)

Nasco (Booth #318)

Thursday, Oct 27	3:30–4:30 PM	102 A/B, Conv. Center	Let's Pick Our Brains (p. 61)
Friday, Oct 28	9:30–10:30 AM	102 A/B, Conv. Center	Let's Pick Our Brains (p. 76)

National Geographic Learning / Cengage Learning (Booth #701)

Friday, Oct 28	11:00 AM–12 Noon	102 A/B, Conv. Center	CONNECTIONS: Three-Dimensional Learning by National Geographic Explorers (p. 81)

PASCO scientific (Booth #501)

Friday, Oct 28	8:00–9:00 AM	101C, Conv. Center	Modeling Climate Change Impacts: Dissolving Carbon Dioxide (p. 70)
Friday, Oct 28	9:30–10:30 AM	101C, Conv. Center	Exploring Misconceptions: Speed and Velocity (p. 75)
Friday, Oct 28	11:00 AM–12 Noon	101C, Conv. Center	Exploring Misconceptions: There Is a Difference Between Heat and Temperature?!? (p. 81)

Pearson Education (Booth #313)

Friday, Oct 28	8:00–9:00 AM	101D, Conv. Center	STEM and *NGSS* Inquiry in Chemistry: Effective, Efficient, Economical (p. 70)
Friday, Oct 28	9:30–10:30 AM	101D, Conv. Center	Teaching Geoscience in an *NGSS*-Focused Curriculum (p. 75)
Friday, Oct 28	11:00 AM–12 Noon	101D, Conv. Center	*Effective Teaching Resources for AP Chemistry* (p. 81)
Friday, Oct 28	12:30–1:30 PM	101D, Conv. Center	Science Denial: Why Does It Seem to Be Increasing...and What Can Educators Do About It? (p. 85)
Friday, Oct 28	2:00–3:00 PM	101D, Conv. Center	New Tools, Insights, and Ways of Understanding Science with *Biology* by Miller and Levine (p. 87)

Pitsco Education (Booth #609)

Friday, Oct 28	12:30–1:30 PM	102 A/B, Conv. Center	Let Your *NGSS* and *CCSS* Lessons Take Flight! (p. 86)

Simulation Curriculum Corp. (Booth #524)

Thursday, Oct 27	9:30–10:30 AM	102 A/B, Conv. Center	Earth and Space Science for the Modern, Interactive Classroom (p. 43)

South Dakota State University (Booth #320)

Friday, Oct 28	2:00–3:00 PM	101A, Conv. Center	Using the Classic Demonstration to Engage Students in Science Talk (p. 87)

TCI (Booth #620)

Thursday, Oct 27	3:30–4:30 PM	102C, Conv. Center	Modeling Earth, the Sun, and Other Stars with Bring Science Alive! (p. 61)
Friday, Oct 28	8:00–9:00 AM	102C, Conv. Center	Analyzing and Interpreting Data Using TCI's Bring Science Alive! (p. 71)
Saturday, Oct 29	8:00–9:00 AM	102C, Conv. Center	Riding the Wave with TCI (p. 99)

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Texas Instruments (Booth #301)

Thursday, Oct 27	9:30–10:30 AM	102 E/F, Conv. Center	Using Maggots, Flies, and Flesh to Solve a Mystery! (p. 44)
Thursday, Oct 27	2:00–3:00 PM	101A, Conv. Center	Smart Management of Water Resources Using TI Graphing Calculators and the TI-Innovator Hub (p. 56)
Friday, Oct 28	2:00–3:00 PM	102 E/F, Conv. Center	Zombie Apocalypse! (p. 88)
Friday, Oct 28	3:30–4:30 PM	102 E/F, Conv. Center	Science Through Engineering Designâ€¦and a Squid! (p. 92)

Vernier Software & Technology (Booth #601)

Friday, Oct 28	8:00–9:00 AM	101H, Conv. Center	Integrating Chromebook with Vernier Data-Collection Technology (p. 70)
Friday, Oct 28	9:30–10:30 AM	101H, Conv. Center	Chemistry with Vernier (p. 76)
Friday, Oct 28	11:00 AM–12 Noon	101H, Conv. Center	Biology with Vernier (p. 81)
Friday, Oct 28	12:30–1:30 PM	101H, Conv. Center	Integrating Chromebook with Vernier Data-Collection Technology (p. 86)
Friday, Oct 28	2:00–3:00 PM	101H, Conv. Center	Integrating iPad with Vernier Data-Collection Technology (p. 87)
Friday, Oct 28	3:30–4:30 PM	101H, Conv. Center	Physics and Physical Science with Vernier (p. 92)

Earth and Space Science

Thursday

8:00–9:00 AM	4–12	200 A/B, Conv. Center	Use NASA Design Challenges to Develop Critical Thinking and Grit (p. 39)
8:00–9:00 AM	6–9	200D, Conv. Center	*NGSS* and Climate Change for Middle School (p. 40)
8:00–9:00 AM	1–12	200E, Conv. Center	Freshwater Stewardship: Equip Your Student-Scientists with Cutting-Edge Resources from NOAA (p. 38)
8:00–9:00 AM	2–4	102C, Conv. Center	Bring Science to Life Through Elementary Robotics with LEGO Education WeDo 2.0 (p. 41)
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9:30–10:30 AM	6–8	101G, Conv. Center	Modeling Convection Currents and Plate Motion (p. 43)
11:00 AM–12 Noon	9–12	101G, Conv. Center	Calling All Carbons (p. 45)
12:30–1:30 PM	9–12	101G, Conv. Center	Climate Proxies (p. 51)
12:30–1:30 PM	7–C	200E, Conv. Center	Online Mapping in Earth and Physical Science Classrooms (p. 47)
12:30–1:30 PM	4–12	200I, Conv. Center	Learning About What Was by Examining What Is, Part 1 (p. 49)
12:30–1:30 PM	6–8	200D, Conv. Center	Seasons in the Sun (p. 49)
12:30–1:30 PM	9–C	200 A/B, Conv. Center	NASA Astrobiology: The Search for Life Beyond Earth (p. 47)
2:00–3:00 PM	G	200C, Conv. Center	The AMS DataStreme Project: Digital Earth Science Education for Teachers (p. 53)
2:00–3:00 PM	9–12	200D, Conv. Center	Climate Change and Forest Ecosystems: A Systems Approach (p. 55)
2:00–3:00 PM	7–C	200E, Conv. Center	A Unique Ice Core Investigation that Integrates the Three Dimensions of the *NGSS* (p. 54)
2:00–3:00 PM	8–12	Marquette VIII, Hilton	Authentic Research in the Classroom: Connecting NITARP with National and State Standards (p. 53)
3:30–4:30 PM	5–12	200E, Conv. Center	Climate Literacy - Climate Solutions (p. 58)
3:30–4:30 PM	K–5	102C, Conv. Center	Modeling Earth, the Sun, and Other Stars with Bring Science Alive! (p. 61)
3:30–4:30 PM	9–12	201 A/B, Conv. Center	U.S. Department of Energy's BioenergizeME Infographic Challenge: Creative Methods to Explore Energy Literacy (p. 59)
5:00–5:30 PM	1–10	206 A/B, Conv. Center	Empowering Our Students to Be Citizen Scientists (p. 62)
5:00–6:00 PM	G	200E, Conv. Center	Bringing Climate Change to Life Through COP21: Teachers at the Paris Climate Talks (p. 63)
5:00–6:00 PM	5–12	200 A/B, Conv. Center	NASA's Eyes on the Solar System: Bringing the Planets to Your Classroom's Computers (p. 62)
5:00–6:00 PM	4–6	Marquette III, Hilton	Whoosh, Crack, Slide, and Crash Your Way into a Grade 5 Earth Science Unit (p. 63

Friday

8:00–9:00 AM	5–12	Minneapolis E–G, Hilton	NESTA Shares: Innovative Ways to Teach About Weather Observation and Weather Hazards (p. 68)
8:00–9:00 AM	9–12	101C, Conv. Center	Modeling Climate Change Impacts: Dissolving Carbon Dioxide (p. 70)
8:00–9:00 AM	G	205 A/B, Conv. Center	School District and Community Engagement in STEM Education on the International Space Station…and Beyond (p. 68)
8:00–9:00 AM	9–12	200F, Conv. Center	AAPT Session: 30 Demos in 60 Minutes (p. 67)
8:00–9:00 AM	1–12	200D, Conv. Center	ARTsome Astronomy (p. 69)
9:30–10:30 AM	9–C	101D, Conv. Center	Teaching Geoscience in an *NGSS*-Focused Curriculum (p. 75)
9:30–10:30 AM	5–12	Minneapolis E–G, Hilton	NESTA Shares: Innovative Ways to Teach About Minerals, Rocks, and Resources (p. 74)
9:30–10:30 AM	3–7	Marquette III, Hilton	Connecting the Skills of Literacy and Science Through Children's Literature and STEM Topics (p. 73)
9:30–10:30 AM	5–12	200D, Conv. Center	Real-World Connections Through Space Systems Science (p. 74)
11:00 AM–12 Noon	5–12	Minneapolis E–G, Hilton	NESTA and CIESIN Share: Exploring a Compendium of Online Resources for Teaching Earth Science (p. 78)
11:00 AM–12 Noon	6–C	200E, Conv. Center	Up, Up, and Away: Stratospheric Ballooning in STEM Education (p. 78)

11:00 AM–12 Noon	6–8	200D, Conv. Center	Moon Mania: Modeling Lunar Phases (p. 79)
11:00 AM–12 Noon	3–6	Rochester, Hilton	Science/Math Integration for a Sustainable Planet (p. 79)
11:00 AM–12 Noon	2–4	102C, Conv. Center	Bring Science to Life Through Elementary Robotics with LEGO Education WeDo 2.0 (p. 82)
12:30–1:30 PM	G	101D, Conv. Center	Science Denial: Why Does It Seem to Be Increasing…and What Can Educators Do About It? (p. 85)
3:30–4:30 PM	8–12	200D, Conv. Center	NASA Earth Science: Real-World Connections to Data and Tools for Science Fairs (p. 90)
3:30–4:30 PM	4	Marquette V, Hilton	Teaching Grade 4 with the *NGSS* (p. 89)
3:30–4:30 PM	4–8	Conrad B/C, Hilton	Deep Time (p. 90)
5:00–6:00 PM	6–12	200D, Conv. Center	Using Recreational UAVs (Drones) for STEM Activities and Science Fair Projects (p. 94)

Saturday

8:00–9:00 AM	5–12	200D, Conv. Center	Coral Reefs: Fragile Wonders Under Threat: Bring Vibrant Environmental Stewardship Lessons to Your Students with Free NOAA Resources (p. 97)
8:00–9:00 AM	5–12	200I, Conv. Center	Demystifying STEM: Collaborate…Don't Isolate (p. 98)
8:00–9:00 AM	7–C	200C, Conv. Center	Exploring the Trade-Offs and Payoffs of Sustainable Bioenergy Through Simulations and Field Data (p. 98)
9:30–10:30 AM	9–12	200C, Conv. Center	Quake-Proof: Applying Newton's Laws of Motion to Building Design (p. 100)
9:30–10:30 AM	6–C	200D, Conv. Center	Polar ICE: Bringing Polar Research to Your Classroom (p. 99)
9:30–10:30 AM	2–4	102C, Conv. Center	Bring Science to Life through Elementary Robotics with LEGO Education WeDo 2.0 (p. 101)
11:00 AM–12 Noon	5–12	200E, Conv. Center	PolarTREC Greenland: Impact of Climate Change on Ecological Systems (p. 101)

Engineering, Technology, and the Application of Science

Thursday

8:00–9:00 AM	2–4	102C, Conv. Center	Bring Science to Life Through Elementary Robotics with LEGO Education WeDo 2.0 (p. 41)
8:00–9:00 AM	4–12	200 A/B, Conv. Center	Use NASA Design Challenges to Develop Critical Thinking and Grit (p. 39)
8:00–9:00 AM	K–5/C	Marquette IV, Hilton	Do Children Aspire to STEM Careers? (p. 37)
11:00 AM–12 Noon	K–5	101E, Conv. Center	Build Skills to Boost the Makerspace Experience for Young Scientists! (p. 45)
11:00 AM–12 Noon	6–12	101 I/J, Conv. Center	An *NGSS* Approach to Engineering in the Upper Grade Bands (p. 44)
12:30–1:30 PM	2–6	101E, Conv. Center	STEM-gineering (p. 50)
12:30–1:30 PM	6–12	101C, Conv. Center	CPO's Wind Turbine: A STEM Approach to Engineering and Design (p. 50)
12:30–1:30 PM	6–12	200G, Conv. Center	Bioplastic—Going from Synthetic to Natural Polymers (p. 47)
12:30–1:30 PM	6–8	200J, Conv. Center	A High-Impact Exploration of Science and Engineering Concepts (p. 49)
12:30–1:30 PM	3–8	Conrad B/C, Hilton	Engineering: Blow the Roof Off! (p. 48)
12:30–1:30 PM	K	Rochester, Hilton	Forces, Motion, and Engineering for Kindergarten? Yes! (p. 48)
12:30–1:30 PM	7–C	203 A/B, Conv. Center	Meaningful STEM (p. 48)
12:30–1:30 PM	P–6	200C, Conv. Center	Building Bridges: Engineering in the Elementary Classroom (p. 49)
2:00–3:00 PM	P–1	Marquette III, Hilton	Three New Lessons for Early Childhood STEM Educators: Engineering (as) an Answer to a Need (p. 53)
2:00–3:00 PM	1–8	Conrad B/C, Hilton	STEM Pathways: Informal Science Institutions and a School District United to Improve STEM Engagement and Learning (p. 53)
2:00–3:00 PM	7–C	200E, Conv. Center	A Unique Ice Core Investigation that Integrates the Three Dimensions of the *NGSS* (p. 54)
2:00–3:00 PM	6–12	101C, Conv. Center	Building Electric Circuits with CPO's New Link™ Learning Module (p. 56)
3:30–4:30 PM	9–12	201 A/B, Conv. Center	U.S. Department of Energy's BioenergizeME Infographic Challenge: Creative Methods to Explore Energy Literacy (p. 59)

5:00–6:00 PM	4–12	200C, Conv. Center	Inventing Is Just Plain Fun (for All)! (p. 63)

Friday

8:00–9:00 AM	4-C	200I, Conv. Center	ASEE Session: LED Projects for Teaching Electrical Concepts (p. 69)
8:00–9:00 AM	1–8	Marquette I/II, Hilton	Designing Lessons for the Private School Setting That Implement the *NGSS* Using the Engineering Design Process (p. 68)
9:30–10:30 AM	6–9	200I, Conv. Center	ASEE Session: Fluid Power Builds Creative Careers (p. 74)
9:30–10:30 AM	3–7	Marquette III, Hilton	Connecting the Skills of Literacy and Science Through Children's Literature and STEM Topics (p. 73)
9:30–10:30 AM	3–8	Rochester, Hilton	Engineering FOR, FROM, and BY Animals: A Powerful Way to Engage Students and Teachers in STEM Learning at the Zoo and in the Classroom (p. 74)
9:30–10:30 AM	4–9	Marquette I/II, Hilton	Electricity Made Simple (p. 73)
9:30–10:30 AM	9–12	203 A/B, Conv. Center	Using Bioinformatics to Teach About the Hidden Message in DNA and Computational Computer Science Skills (p. 73)
9:30–10:30 AM	5–12	200D, Conv. Center	Real-World Connections Through Space Systems Science (p. 74)
9:30–10:30 AM	1–5	101F, Conv. Center	The Best of Engineering for Elementary Students (p. 75)
9:30–10:30 AM	6–8	101A, Conv. Center	Not Your Typical Classroom Experience: Amplify Science's Digital Engineering Internships (p. 75)
9:30–10:30 AM	4–12	200J, Conv. Center	NEXT Generation Robotics (Made Simple) (p. 74)
11:00–11:30 AM	K–3	200 A/B, Conv. Center	Laser Cutters + 3D Printers + Vinyl Cutters = Bolstered K–3 Math Curriculum (p. 77)
11:00 AM–12 Noon	10–C	200I, Conv. Center	ASEE Session: Digital Electronics Demystified: From "0" to "1" in a Single Session (p. 80)
11:00 AM–12 Noon	2–4	102C, Conv. Center	Bring Science to Life through Elementary Robotics with LEGO Education WeDo 2.0 (p. 82)
11:00 AM–12 Noon	6–9	101 I/J, Conv. Center	What's the Problem? Integrating Engineering into the Science Classroom Without Bridges and Rockets (p. 80)
11:00 AM–12 Noon	6–C	200E, Conv. Center	Up, Up, and Away: Stratospheric Ballooning in STEM Education (p. 78)
11:00 AM–12 Noon	2–9	Marquette I/II, Hilton	Elementary and Middle School STEM Activities (p. 79)
11:00 AM–12 Noon	6–C	205 A/B, Conv. Center	Featured Presentation: Wearable Technology and the Connected World (p. 77)
12:30–1:30 PM	4–12	200C, Conv. Center	"Bee" STEMified: The Powerful Story of the Pollinator…Revealed Through Collaborative Effort (p. 83)
12:30–1:30 PM	6–12	101F, Conv. Center	Engineer Hands-On Chemistry Fun with a Carolina STEM Challenge®! (p. 86)
12:30–1:30 PM	5–12	200D, Conv. Center	Build, Ignite, and Launch (p. 84)
12:30–1:30 PM	6–12	206 A/B, Conv. Center	Inspire by Example: Role Models in the Classroom (p. 83)
12:30–1:30 PM	6–12	101 I/J, Conv. Center	An *NGSS* Approach to Engineering in the Upper Grade Bands (p. 85)
12:30–1:30 PM	5–9	Marquette I/II, Hilton	NMLSTA-Sponsored Session: Get Wet! Teaching Students About the Great Lakes Using Engineering Design (p. 84)
12:30–1:30 PM	K–5	Marquette V, Hilton	A Picture-Perfect Approach to Connecting Reading Strategies and Science (p. 82)
12:30–1:30 PM	7–C	208A, Conv. Center	What Do You Mean I Have to Teach Engineering? (p. 85)
12:30–1:30 PM	6–9	200I, Conv. Center	ASEE Session: Engineering Design: A Template for Critical Considerations in Integrated STEM Education (p. 84)
3:30–4:30 PM	K–12	200I, Conv. Center	ASEE Session: ASEE's K–12 Outreach—Engineering, Go For It (eGFI), Teach Engineering, Link Engineering, and the National Science Digital Library (p. 91)
3:30–4:30 PM	9–12	101G, Conv. Center	Energy Flow Through an Ecosystem (p. 92)
3:30–4:30 PM	8–12	200D, Conv. Center	NASA Earth Science: Real-World Connections to Data and Tools for Science Fairs (p. 90)
3:30–4:30 PM	4–6	Marquette I/II, Hilton	Taking STEM Outside (p. 90)
3:30–4:30 PM	6–12	102 E/F, Conv. Center	Science Through Engineering Design…and a Squid! (p. 92)
3:30–4:30 PM	4	Marquette V, Hilton	Teaching Grade 4 with the *NGSS* (p. 89)
5:00–6:00 PM	6–C	206 A/B, Conv. Center	Science in the News (p. 93)
5:00–6:00 PM	6–12	200D, Conv. Center	Using Recreational UAVs (Drones) for STEM Activities and Science Fair Projects (p. 94)

Saturday

8:00–9:00 AM	1–12	205D, Conv. Center	3D Printing in the K–12 Classroom (p. 97)
8:00–9:00 AM	5–12	200I, Conv. Center	Demystifying STEM: Collaborate…Don't Isolate (p. 98)
8:00–9:00 AM	3–C	205C, Conv. Center	Using Engineering Design to Collaboratively Create Engineering Design (p. 97)
9:30–10:30 AM	7–8	205C, Conv. Center	Biomedical Engineering STEM Lessons (p. 99)
9:30–10:30 AM	3–5	200J, Conv. Center	What Do Engineers Do? Exploring Engineering Design in Your Elementary Classroom (p. 100)
9:30–10:30 AM	2–4	102C, Conv. Center	Bring Science to Life through Elementary Robotics with LEGO Education WeDo 2.0 (p. 101)
9:30–10:30 AM	7–C	101B, Conv. Center	Build a Box: Engineering Food Dye Electrophoresis for *NGSS* (p. 101)
11:00 AM–12 Noon	K–8	200J, Conv. Center	Coding in K–8 Classrooms: Start Them Early! (p. 103)
11:00 AM–12 Noon	5–8	200C, Conv. Center	Engineering from Every Angle: Engineers as Proficient in Emotional Intelligence as Well as Analytical Skills (p. 102)
11:00 AM–12 Noon	P–5	206 A/B, Conv. Center	Infusing Creativity in the Classroom (p. 102)

Life Science

Thursday

8:00–9:00 AM	7–C	200C, Conv. Center	Searching for Spielberg (p. 38)
8:00–9:00 AM	9–12	101C, Conv. Center	Modeling Climate Change Impacts: Dissolving Carbon Dioxide (p. 70)
8:00–9:00 AM	3–6	Marquette III, Hilton	Native Plants and Seeds, Oh My! (p. 39)
8:00–9:00 AM	1–12	200I, Conv. Center	Stretch Your Legs for Science! (p. 40)
8:00–9:00 AM	2–4	102C, Conv. Center	Bring Science to Life Through Elementary Robotics with LEGO Education WeDo 2.0 (p. 41)
8:00–9:00 AM	7–C	200J, Conv. Center	High Five: Five Ways to Make Teaching Biotechnology Faster, Easier, and Cheaper (p. 40)
8:00–9:00 AM	6–8	101G, Conv. Center	Gas Exchange (p. 41)
8:00–9:00 AM	6–C	101H, Conv. Center	Martian Genetics (p. 41)
9:30–10:30 AM	6–C	101H, Conv. Center	Left at the Scene of the Crime: Introduction to Forensic Science (p. 43)
9:30–10:30 AM	6–12	101F, Conv. Center	Engineer Excitement with a Carolina STEM Challenge® (p. 43)
11:00 AM–12 Noon	K–5	101F, Conv. Center	Carolina's Young Scientist™ Dissections with Carolina's Perfect Solution® Specimen (p. 45)
11:00 AM–12 Noon	6–12	101C, Conv. Center	CPO's Link™ Genetics Learning Modules: Crazy Chromosomes and Crazy Traits (p. 44)
11:00 AM–12 Noon	9–C	101H, Conv. Center	Exploring the Genetics of Taste: SNP Analysis of the PTC Gene Using PCR (p. 45)
12:30–1:30 PM	6–C	101H, Conv. Center	Outbreak! Zika Testing Using the Enzyme-Linked Immunosorbent Assay (ELISA) (p. 51)
12:30–1:30 PM	6–12	200G, Conv. Center	Bioplastic—Going from Synthetic to Natural Polymers (p. 47)
12:30–1:30 PM	8–12	102 E/F, Conv. Center	Constructing and Crossing Cell Membranes (p. 51)
12:30–1:30 PM	K–6	102 A/B, Conv. Center	Use Science to Teach Reading, Reading to Teach Science (p. 51)
12:30–1:30 PM	9–C	205D, Conv. Center	Regenerative Medicine in the Classroom: Inquiry-Based Instruction (p. 48)
12:30–1:30 PM	9–C	200 A/B, Conv. Center	NASA Astrobiology: The Search for Life Beyond Earth (p. 47)
12:30–1:30 PM	P–K	Marquette V, Hilton	Tracking Change Over Time: Earth Imagery in the Classroom (p. 47)
2:00–3:00 PM	8–C	102 E/F, Conv. Center	The Many Jobs of Proteins: Enzymes in the Spotlight (p. 57)
2:00–3:00 PM	1–8	Conrad B/C, Hilton	STEM Pathways: Informal Science Institutions and a School District United to Improve STEM Engagement and Learning (p. 53)
2:00–3:00 PM	P–5	Marquette IV, Hilton	Outdoor Learning (p. 53)
2:00–3:00 PM	K–12	203 A/B, Conv. Center	Meeting *NGSS* Practices Through Citizen Science and School Yard Investigations (p. 54)
2:00–3:00 PM	9–C	101H, Conv. Center	Using Biotechnology to Diagnose HIV/AIDS (p. 57)
3:30–4:30 PM	3–C	200J, Conv. Center	Biological Machines: Bioengineering Activities for the Classroom (p. 60)

3:30–4:30 PM	9–12	201 A/B, Conv. Center	U.S. Department of Energy's BioenergizeME Infographic Challenge: Creative Methods to Explore Energy Literacy (p. 59)
3:30–4:30 PM	6–8	101D, Conv. Center	Evolutionary Evidence in the Fossil Record: Life Science with FOSS (p. 60)
3:30–4:30 PM	K–12	101F, Conv. Center	Hands-On Science with Classroom Critters (p. 61)
3:30–4:30 PM	P–8	102 A/B, Conv. Center	Let's Pick Our Brains (p. 61)
3:30–4:30 PM	9–C	101H, Conv. Center	Environmental Toxicology Using Edvotek's New EZ-elegans (p. 61)
5:00–6:00 PM	4–8	Marquette V, Hilton	Student Investigations: Get Good Questions! (p. 62)
5:00–6:00 PM	6–C	200I, Conv. Center	Zombies Don't Stand a Chance Against STEM! (p. 64)

Friday

8:00–9:00 AM	C	203 A/B, Conv. Center	Global Anatomy and Physiology Students Display Interest in Curated Online Help (p. 67)
8:00–9:00 AM	K–2	Marquette III, Hilton	"Bee" Wild About Pollinators (p. 67)
8:00–9:00 AM	4–9	200C, Conv. Center	The Monarch Butterfly: Sophisticated Science (p. 67)
8:00–9:00 AM	9–12	200F, Conv. Center	AAPT Session: 30 Demos in 60 Minutes (p. 67)
8:00–9:00 AM	9–12	101E, Conv. Center	Exploring a Genetic Trait with Stickleback Fish (p. 70)
8:00–9:00 AM	9–12	101F, Conv. Center	Shark Dissection: A Jawsome Experience! (p. 70)
8:00–9:00 AM	9–C	101B, Conv. Center	Contagion! Track the Progress of Dangerous Viruses that Are Spreading Throughout the Country (p. 69)
8:00–9:00 AM	9–C	102 E/F, Conv. Center	Let's Get Helical: Exploring DNA Structure and Function with Physical Models (p. 71)
9:30–10:00 AM	7–C	Marquette IV, Hilton	ASTE-Sponsored Session: Milkweed Adaptation Distributed Research Project (p. 71)
9:30–10:30 AM	6–8	208 C/D, Conv. Center	NSTA Press® Session: *Argument-Driven Inquiry in Physical and Life Science: Lab Investigations for Grades 6–8* (p. 74)
9:30–10:30 AM	4–8	200 A/B, Conv. Center	Citizen Science: Projects and Activities to Engage Students in Authentic Science Research (p. 72)
9:30–10:30 AM	3–8	Rochester, Hilton	Engineering FOR, FROM, and BY Animals: A Powerful Way to Engage Students and Teachers in STEM Learning at the Zoo and in the Classroom (p. 74)
9:30–10:30 AM	9–12	203 A/B, Conv. Center	Using Bioinformatics to Teach About the Hidden Message in DNA and Computational Computer Science Skills (p. 73)
9:30–10:30 AM	9–C	102 E/F, Conv. Center	3D Printing for the BioScience Classroom (p. 76)
9:30–10:30 AM	8–C	101B, Conv. Center	Investigate Photosynthesis and Cellular Respiration with Algae Beads (p. 75)
9:30–10:30 AM	9–12	101E, Conv. Center	Connect Your Classroom with HHMI BioInteractive's Lizard Evolution Virtual Lab (p. 75)
9:30–10:30 AM	5–C	102C, Conv. Center	Hands-On Approach to Teaching Anatomy and Physiology! (p. 76)
9:30–10:30 AM	P–8	102 A/B, Conv. Center	Let's Pick Our Brains (p. 76)
9:30–10:30 AM	6–C	102D, Conv. Center	miniPCR PTC Taster Lab—From Genotype to Phenotype (p. 76)
11:00–11:30 AM	3	Marquette IV, Hilton	ASTE-Sponsored Session: Using Corn as a Model Organism to Foster Students' Agricultural Literacy and Understanding of Plant Genetics (p. 77)
11:00 AM–12 Noon	5–C	208 C/D, Conv. Center	NSTA Press® Session: Argumentation in the Biology Science Classroom (p. 80)
11:00 AM–12 Noon	1–6	Marquette III, Hilton	Understanding Seed Dispersal with Engineering Practices and Trade Books (p. 79)
11:00 AM–12 Noon	7–9	203 A/B, Conv. Center	Forensic Anthropology: A STEAM Approach to Teaching the Skeletal System (p. 78)
11:00 AM–12 Noon	2–4	102C, Conv. Center	Bring Science to Life through Elementary Robotics with LEGO Education WeDo 2.0 (p. 82)
11:00 AM–12 Noon	6–C	200E, Conv. Center	Up, Up, and Away: Stratospheric Ballooning in STEM Education (p. 78)
11:00 AM–12 Noon	3–6	Rochester, Hilton	Science/Math Integration for a Sustainable Planet (p. 79)
11:00 AM–12 Noon	9–12	101E, Conv. Center	Biological Balance: Skin Color, Reproductive Fitness, and Vitamin D Deficiency (p. 81)
11:00 AM–12 Noon	6–12	101F, Conv. Center	Autopsy: Forensic Dissection Featuring Carolina's Perfect Solution® Pigs (p. 81)
11:00 AM–12 Noon	9–12	101H, Conv. Center	Biology with Vernier (p. 81)
11:00 AM–12 Noon	9–C	101B, Conv. Center	The GMO Debate Rages On! (p. 80)
11:00 AM–12 Noon	9–C	102 E/F, Conv. Center	Telling Stories with David Goodsell's Watercolor Molecular Landscapes (p. 82)

12:30–1:30 PM	4–12	200C, Conv. Center	"Bee" STEMified: The Powerful Story of the Pollinator…Revealed Through Collaborative Effort (p. 83)
12:30–1:30 PM	G	101D, Conv. Center	Science Denial: Why Does It Seem to Be Increasing…and What Can Educators Do About It? (p. 85)
12:30–1:30 PM	9–C	101B, Conv. Center	How to Use Pop Culture in Your Life Science Class (p. 85)
12:30–1:30 PM	9–12	101E, Conv. Center	A Prep-"Free" ELISA Activity with HHMI BioInteractive's Immunology Virtual Lab (p. 86)
12:30–1:30 PM	9–12	101G, Conv. Center	What Is a Species (p. 86)
12:30–1:30 PM	6–12	203 A/B, Conv. Center	Teach Evolution with the World's Most Extravagant Birds (p. 83)
2:00–3:00 PM	8–12	101E, Conv. Center	Ecology, Africa, and HHMI, Oh My! (p. 87)
2:00–3:00 PM	G	101D, Conv. Center	New Tools, Insights, and Ways of Understanding Science with *Biology* by Miller and Levine (p. 87)
2:00–3:00 PM	9–12	101G, Conv. Center	Cell Differentiation and Gene Expression (p. 87)
3:30–4:30 PM	9–12	101G, Conv. Center	Energy Flow Through an Ecosystem (p. 92)
3:30–4:30 PM	9–12	101E, Conv. Center	Explore Biotechnology Using Free HHMI BioInteractive Resources (p. 92)
3:30–4:30 PM	K–12	101F, Conv. Center	Introduction to Wisconsin Fast Plants® (p. 92)
3:30–4:30 PM	6–12	203 A/B, Conv. Center	Edible Labs (p. 89)
3:30–4:30 PM	4–6	Marquette I/II, Hilton	Taking STEM Outside (p. 90)
3:30–4:30 PM	6–8	200 A/B, Conv. Center	Evolution for Educators (p. 90)

Saturday

8:00–9:00 AM	5–12	200D, Conv. Center	Coral Reefs: Fragile Wonders Under Threat: Bring Vibrant Environmental Stewardship Lessons to Your Students with Free NOAA Resources (p. 97)
8:00–9:00 AM	7–C	200C, Conv. Center	Exploring the Trade-Offs and Payoffs of Sustainable Bioenergy Through Simulations and Field Data (p. 98)
8:00–9:00 AM	9–C	208 C/D, Conv. Center	NSTA Press® Session: *Argument-Driven Inquiry in Biology: Lab Investigations for Grades 9–12* (p. 98)
8:00–9:00 AM	1–8	206 A/B, Conv. Center	Habitat Connections: Action Through Citizen Science and Creating Bird-Friendly School Yards (p. 97)
8:00–9:00 AM	K–12	203 A/B, Conv. Center	Developing Science Process Skills Through School Yard Investigations (p. 97)
8:00–9:00 AM	9–12	101G, Conv. Center	Photosynthesis and Respiration: It's a Plant's Life! (p. 98)
8:00–9:00 AM	9–C	102 E/F, Conv. Center	Genes, Genomes, and Personalized Medicine (p. 99)
8:00–9:00 AM	5–C	201 A/B, Conv. Center	Bringing the Abstract to Life with Live Animals in the Classroom (p. 97)
8:00–9:00 AM	8–C	101B, Conv. Center	Investigate Photosynthesis and Cellular Respiration with Algae Beads (p. 98)
9:30–10:30 AM	9–C	102 E/F, Conv. Center	Of All the Nerve: Modeling Neurotransmission (p. 101)
9:30–10:30 AM	9–12	101G, Conv. Center	Adding Some Color to Science (p. 101)
9:30–10:30 AM	2–4	102C, Conv. Center	Bring Science to Life through Elementary Robotics with LEGO Education WeDo 2.0 (p. 101)
9:30–10:30 AM	7–8	205C, Conv. Center	Biomedical Engineering STEM Lessons (p. 99)
9:30–10:30 AM	5–C	200 A/B, Conv. Center	Dissecting Animals? Frog-get About It! (p. 100)
11:00 AM–12 Noon	5–12	200E, Conv. Center	PolarTREC Greenland: Impact of Climate Change on Ecological Systems (p. 101)

Physical Science

Thursday

8:00–9:00 AM	7–C	200C, Conv. Center	Searching for Spielberg (p. 38)
8:00–9:00 AM	4-C	200I, Conv. Center	ASEE Session: LED Projects for Teaching Electrical Concepts (p. 69)
8:00–9:00 AM	6–8	101D, Conv. Center	Wave Properties and Information Transfer (p. 41)
8:00–9:00 AM	K–5	101F, Conv. Center	Waves, Waves, Waves: Building Models to Explain Phenomena (p. 41)
8:00–9:00 AM	6–12	101C, Conv. Center	CPO's Link™ with Car and Ramp: Force, Motion, and Variables (p. 40)

8:00–9:00 AM	6–12	200G, Conv. Center	Polymer Food Chemistry: Have Fun with Polymer Chemistry by Making Mountain DewViar (p. 38)
8:00–9:00 AM	2–4	102C, Conv. Center	Bring Science to Life Through Elementary Robotics with LEGO Education WeDo 2.0 (p. 41)
9:30–10:30 AM	9–12	101 I/J, Conv. Center	Year-Round Solutions for Success in AP Chemistry from Flinn Scientific (p. 42)
9:30–10:30 AM	6–12	101F, Conv. Center	Engineer Excitement with a Carolina STEM Challenge® (p. 43)
11:00 AM–12 Noon	5–C	102 E/F, Conv. Center	Dive In with Magnetic Water Molecules (p. 45)
12:30–1:30 PM	8–12	102 E/F, Conv. Center	Constructing and Crossing Cell Membranes (p. 51)
12:30–1:30 PM	P–K	Marquette V, Hilton	Tracking Change Over Time: Earth Imagery in the Classroom (p. 47)
12:30–1:30 PM	7–C	200E, Conv. Center	Online Mapping in Earth and Physical Science Classrooms (p. 47)
12:30–1:30 PM	K	Rochester, Hilton	Forces, Motion, and Engineering for Kindergarten? Yes! (p. 48)
12:30–1:30 PM	3–8	102C, Conv. Center	Bringing STEM to Light (p. 51)
2:00–3:00 PM	7–C	200E, Conv. Center	A Unique Ice Core Investigation that Integrates the Three Dimensions of the *NGSS* (p. 54)
2:00–3:00 PM	9–12	200G, Conv. Center	Meet the Standards and Enhance Your Chemistry Classroom with Other People's Money (p. 54)
2:00–3:00 PM	8–C	102 E/F, Conv. Center	The Many Jobs of Proteins: Enzymes in the Spotlight (p. 57)
2:00–3:00 PM	6–8	101G, Conv. Center	Chemical Batteries (p. 57)
2:00–3:00 PM	9–12	200H, Conv. Center	STEM Chem: Bringing Engineering into the Chemistry Classroom (p. 55)
2:00–3:00 PM	9–12	101F, Conv. Center	Keep Calm and Chemistry On: Successful Lab Activities for the New Chemistry Teacher (p. 56)
2:00–3:00 PM	K–5	101D, Conv. Center	What Does Conceptual Modeling Look Like in an Elementary Classroom? (p. 56)
2:00–3:00 PM	9–12	101 I/J, Conv. Center	Flinn Scientific's Exploring Chemistry™: Connecting Content Through Experiments (p. 56)
3:30–4:00 PM	10–11	200F, Conv. Center	Educational Collaboration with the Chemical Heritage Foundation (p. 58)
3:30–4:30 PM	6–12	101C, Conv. Center	CPO Science's Link™ Module: Learning About Chemistry Models (p. 60)
3:30–4:30 PM	9–12	200H, Conv. Center	Video Analysis and Spreadsheets with Air Cannons (p. 60)
3:30–4:30 PM	6–8	101G, Conv. Center	Reclaiming the Metal (p. 61)
3:30–4:30 PM	9–12	201 A/B, Conv. Center	U.S. Department of Energy's BioenergizeME Infographic Challenge: Creative Methods to Explore Energy Literacy (p. 59)
3:30–4:30 PM	9–12	200G, Conv. Center	Potpourri of Chemistry Engagement Strategies (p. 59)
4:00–4:30 PM	10–11	200F, Conv. Center	Technology, Data, and Chemistry (p. 62)
5:00–5:30 PM	1–10	206 A/B, Conv. Center	Empowering Our Students to Be Citizen Scientists (p. 62)
5:00–6:00 PM	9–12	200H, Conv. Center	Implementing Physics First in Missouri (p. 64)
5:00–6:00 PM	5–12	200G, Conv. Center	Chemistry Concepts STEAM-ified (p. 63)
5:00–6:00 PM	4–8	Conrad B/C, Hilton	Inquiry Matters: Identify Unknown Liquids (p. 63)

Friday

8:00–9:00 AM	6–8	101G, Conv. Center	Waves (p. 70)
8:00–9:00 AM	9–12	101D, Conv. Center	STEM and *NGSS* Inquiry in Chemistry: Effective, Efficient, Economical (p. 70)
8:00–9:00 AM	7-12	101 I/J, Conv. Center	Fantastic Physical Science Demonstrations from Flinn Scientific (p. 69)
8:00–9:00 AM	9–12	101C, Conv. Center	Modeling Climate Change Impacts: Dissolving Carbon Dioxide (p. 70)
8:00–9:00 AM	9–12	200E, Conv. Center	Solids: The Neglected "State" of Chemistry (p. 67)
8:00–9:00 AM	P–1	Rochester, Hilton	Magnificent Magnets (p. 68)
8:00–9:00 AM	9–12	200F, Conv. Center	AAPT Session: 30 Demos in 60 Minutes (p. 67)
8:00–10:00 AM	9–12	200H, Conv. Center	ACS Session One: Energy in Chemistry—A Macroscopic View (p. 71)
9:30–10:30 AM	9–12	101C, Conv. Center	Exploring Misconceptions: Speed and Velocity (p. 75)
9:30–10:30 AM	4–12	200E, Conv. Center	Using Pop Culture and Polymers to Create Inquisitive Minds (p. 72)
9:30–10:30 AM	6–8	208 C/D, Conv. Center	NSTA Press® Session: *Argument-Driven Inquiry in Physical and Life Science: Lab Investigations for Grades 6–8* (p. 74)
9:30–10:30 AM	P–8	200F, Conv. Center	AAPT Session: 30 Demos in 60 Minutes: Elementary and Middle School (p. 72)
9:30–10:30 AM	6–8	200G, Conv. Center	ACS Middle Level Session: Solids, Liquids, Gases, and Changes of State (p. 74)
9:30–10:30 AM	4–9	Marquette I/II, Hilton	Electricity Made Simple (p. 73)

9:30–10:30 AM	9–12	101H, Conv. Center	Chemistry with Vernier (p. 76)
9:30–10:30 AM	3–10	101 I/J, Conv. Center	Cool! Can We Do That Again?! (p. 75)
9:30–10:30 AM	9–12	101G, Conv. Center	pH Scale and Math Modeling (p. 75)
9:30–10:30 AM	9–C	102 E/F, Conv. Center	3D Printing for the BioScience Classroom (p. 76)
10:30 AM–12:30 PM	9–12	200H, Conv. Center	ACS Session Two: Energy in Chemistry—A Particulate View (p. 77)
11:00 AM–12 Noon	6–8	200G, Conv. Center	ACS Middle Level Session: Density: A Molecular View (p. 79)
11:00 AM–12 Noon	2–9	Marquette I/II, Hilton	Elementary and Middle School STEM Activities (p. 79)
11:00 AM–12 Noon	9–12	101G, Conv. Center	Chemical Formula and Amino Acids (p. 81)
11:00 AM–12 Noon	9–12	101D, Conv. Center	*Effective Teaching Resources for AP Chemistry* (p. 81)
11:00 AM–12 Noon	2–4	102C, Conv. Center	Bring Science to Life through Elementary Robotics with LEGO Education WeDo 2.0 (p. 82)
11:00 AM–12 Noon	6–C	200E, Conv. Center	Up, Up, and Away: Stratospheric Ballooning in STEM Education (p. 78)
11:00 AM–12 Noon	6–12	101C, Conv. Center	Exploring Misconceptions: There Is a Difference Between Heat and Temperature?!? (p. 81)
11:00 AM–12 Noon	9–12	200F, Conv. Center	AAPT Session: Physics on the Cheap (p. 79)
11:00 AM–12 Noon	P-3	200C, Conv. Center	Let's Get Physical: From Force and Friction to Water and Weather (p. 79)
12:30–1:30 PM	6–8	200G, Conv. Center	ACS Middle Level Session: The Water Molecule and Dissolving (p. 84)
12:30–1:30 PM	9–12	200F, Conv. Center	AAPT Session: High School Students Discovering the World of Particle Physics (p. 84)
12:30–1:30 PM	7–C	208A, Conv. Center	What Do You Mean I Have to Teach Engineering? (p. 85)
12:30–1:30 PM	K–5	Marquette V, Hilton	A Picture-Perfect Approach to Connecting Reading Strategies and Science (p. 82)
12:30–1:30 PM	6–8	102C, Conv. Center	Making Student Engagement with Science Practices Meaningful (p. 86)
12:30–1:30 PM	3–6	102 A/B, Conv. Center	Let Your *NGSS* and *CCSS* Lessons Take Flight! (p. 86)
12:30–1:30 PM	6–12	101F, Conv. Center	Engineer Hands-On Chemistry Fun with a Carolina STEM Challenge®! (p. 86)
2:00–3:00 PM	6–C	101A, Conv. Center	Using the Classic Demonstration to Engage Students in Science Talk (p. 87)
2:00–3:00 PM	9–12	102C, Conv. Center	The Science of Invisibility Muggles! (p. 88)
3:00–5:00 PM	9–12	200H, Conv. Center	ACS Session Three: Energy in Chemistry—An Atomic View (p. 88)
3:30–4:30 PM	6–8	200G, Conv. Center	ACS Middle Level Session: Chemical Reactions: Breaking and Making Bonds (p. 91)
3:30–4:30 PM	7–12	101H, Conv. Center	Physics and Physical Science with Vernier (p. 92)
3:30–4:30 PM	9–C	101B, Conv. Center	Enzymes: Technology Inspired by Nature (p. 92)
3:30–4:30 PM	K–5	Marquette IX, Hilton	Inquiry and Self-Directed Learning (p. 90)
3:30–4:30 PM	8–C	200E, Conv. Center	Auto/Cars: A Fun and Relevant Way to Teach Physical Science (Chemistry) Concepts (p. 89)
3:30–4:30 PM	9–12	101G, Conv. Center	Energy Flow Through an Ecosystem (p. 92)
3:30–4:30 PM	4	Marquette V, Hilton	Teaching Grade 4 with the *NGSS* (p. 89)
3:30–4:30 PM	6–12	203 A/B, Conv. Center	Edible Labs (p. 89)
3:30–4:30 PM	9–12	200F, Conv. Center	AAPT Session: Physics Make-and-Take Potpourri (p. 91)
3:30–4:30 PM	9–C	200C, Conv. Center	NSTA Press® Session: *Argument-Driven Inquiry in Chemistry: Lab Investigations for Grades 9–12* (p. 90)
5:00–6:00 PM	9–12	200F, Conv. Center	AAPT Session: Enhancing Physics Instruction with Technology (p. 94)
5:00–6:00 PM	9–C	200 A/B, Conv. Center	Direct Measurement Video for Science Inquiry (p. 93)
5:00–6:00 PM	4–11	208A, Conv. Center	NASA Brings You Newton's Laws of Motion (p. 93)
5:00–6:00 PM	7–12	208 C/D, Conv. Center	Learn How to Use a Modeling Approach to Teach Chemistry Concepts (p. 94)

Saturday

8:00–9:00 AM	5–12	200D, Conv. Center	Coral Reefs: Fragile Wonders Under Threat: Bring Vibrant Environmental Stewardship Lessons to Your Students with Free NOAA Resources (p. 97)
8:00–9:00 AM	6–12	200G, Conv. Center	Basic Polymer Science for the Science Classroom (p. 97)
8:00–9:00 AM	K–5	102C, Conv. Center	Riding the Wave with TCI (p. 99)
8:00–9:00 AM	9–C	200H, Conv. Center	Teaching Kinematics with Programmable Cars (p. 98)
9:30–10:30 AM	5–C	208 C/D, Conv. Center	NSTA Press® Session: Argumentation in the Physical Science/Physics Science Classroom (p. 100)
9:30–10:30 AM	7–C	101B, Conv. Center	Build a Box: Engineering Food Dye Electrophoresis for *NGSS* (p. 101)

9:30–10:30 AM	9–12	200C, Conv. Center	Quake-Proof: Applying Newton's Laws of Motion to Building Design
9:30–10:30 AM	9–12	200H, Conv. Center	Connect Chemistry to Your World with ChemClub (p. 100)
9:30–10:30 AM	2–4	102C, Conv. Center	Bring Science to Life through Elementary Robotics with LEGO Education WeDo 2.0 (p. 101)
9:30–10:30 AM	6–12	200G, Conv. Center	Pedagogical Decisions Using Atomic-Molecular Simulations/Models for Gas Pressure (p. 100)
11:00 AM–12 Noon	K–12	200H, Conv. Center	Spark Students' Curiosity with Chemistry! (p. 101)

General Science Education

Thursday

8:00–8:30 AM	1–6/C	Conrad A, Hilton	Elementary STEM Fellowship (p. 37)
8:00–9:00 AM	G	203 A/B, Conv. Center	Teaching Students to Ask Their Own STEM Questions (p. 38)
8:00–9:00 AM	K–6	Rochester, Hilton	Developing Science Knowledge and Conceptual Understanding, Teaching Science Literacy Skills, and Engaging Students with Quality Nonfiction Science Books (p. 38)
8:00–9:00 AM	9–12	205D, Conv. Center	*NGSS* and SBG (Standards-Based Grading), Together at Last! (p.38)
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Informal Science Education

Thursday

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Day	Time	Room Number 101H
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